Discource Analysis

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Deliverable Nine: Discourse Analysis

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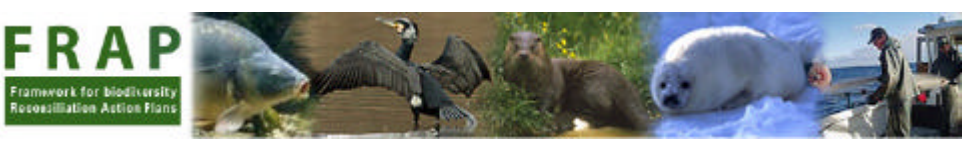

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1 Goals and Methodology

1.1 Introduction

The objective of WP 6 is to describe who the local stakeholders are in the conflicts between fisheries and fish eating vertebrates and what these stakeholders want. Creating a Framework Reconciliation Action Plan requires, among many other components, a sensitivity to local political realities. Such sensitivity cannot be achieved from a third person, outsider perspective, it must be based on a second person, participatory perspective that tries to understand the way facts, interests and values are understood from the inside out. Both the identity of the local stakeholders and their desires should be understood in the terms and categories the local stakeholders themselves are using. Such an understanding is critical if the participatory decision strategies and the framework of action plans are to respond meaningful to the political and social realities in which mitigation policies are created and implemented.

WP 6 used two standard social science approaches to accomplish this. Each one of which is a separate deliverable. The first is a Social Impact Assessment of the conflict and potential mitigation strategies. This includes private and local strategies as well as public and governmental strategies. An Social Impact Assessment consists of describing both the costs and benefits of the conflicts and mitigation strategies and, just as important, how these costs and benefits are distributed among local stakeholders. These costs and benefits include but are not limited to quantitative and economic information, as both costs and benefits can take qualitative and non-economic forms. The Social Impact Assessment was completed and delivered as Deliverable Five in March of 2004.

The present report is Deliverable Nine, The Discourse Analyses. A discourse analysis is a qualitative analysis of local stakeholders' perceptions of and discourses about the conflict and mitigation strategies. This approach uses "grounded theory". This means that information generated by semi-structured interviews is used inductively to identify the categories that the local stakeholders themselves use to understand the conflict. The discourse analysis is a module for the reconciliation action plan from each model region. This consists of a description of the principle local stakeholders in the model region, and their perceptions of and discourses about the conflict. This module is an important part of the development of the participatory decision strategies in Work Package 10 and the final Reconciliation Action Plan in Work Package 11.

1.2 A Brief Description of the Theory behind Discourse Analysis

The theoretical basis of the discourse analysis is best understood as in contrast to the two other basic social science approaches: the atomistic view and the structural view. The best example of the atomistic view is economics, but a good deal of political science and sociology also uses this approach. The atomistic view understands society as interacting actors in pursuit of objectives and seeks to understand how this competitive behaviour creates aggregate patterns. In this view communication understood as tactics, people make the claims they make in order to achieve their goals. Hence the analysis of communication consists of linking statements to goals. The structural approach is used in some sociology and anthropology. It sees society as made up of groups which form the attitudes of their members through world views or ideologies. In this approach, communications are seen as expressions of these world views and the analysis of communication consists of describing world views of groups. These approaches are very different, but they both focus on what is going on in people's heads,

either in terms of what their goals are or in terms of how they perceive the world. Discourse analysis begins from the embeddedness perspective. This perspective sees society as a shared reality made up of and reproduced by statements that draw on mutual understandings. Here, communications are understood as an interactive process of social construction and analysis describes mutual understandings. After beginning from identifying these shared understandings, then the ways they relate to both goals and world views completes the analysis. The focus is on the truly social, i.e., what goes on between people them meanings and understandings that they share.

The basic methods for achieving this are hermeneutic induction and rhetorical analysis. Hermeneutic induction starts with what people say and relate this to the whole discourse in a pattern called the hermeneutic circle. The circle points to the way that interpretation is always done. When a person hears and utterance or sees a line of text they try to understand it, but they can only do so by relating the line of text to the context in which it is found. When they begin this interpretive process the only picture they have of this context is this first line. The next line they read tells them just a bit more about the overall context and this increased understanding of the context then aids the interpretation of the line. This circular movement of re-enforced understanding between the individual statement and the context in which the statement is made makes it impossible to separate the line from the context or the context from the line. Discourse analysis uses this same circular movement, broken down methodologically through grounded theory and the use of textual analysis software. It builds the theory, i.e., the picture of the overall discourse, from the bottom up while keeping the whole in mind. Because this is necessarily an interpretive process, the scientific aspects of the exercise are derived from the careful documentation of these movements, made possible by the textual analysis software, and by being true to what people have said in interviews, and staying neutral and not privileging stakeholders or policies.

The basic units of the analysis are "themes". Themes are repeated patterns in which facts, values and interests are linked in the same way by participants in the discourse. As an interpretive phenomenon the themes cannot be given precise boundaries and different ways of describing themes can be valid. The only meaningful test is the degree to which participants in the discourse see the analysis of the themes as coherent. Some groups will agree with particular themes, some groups will disagree with the themes, but all the groups should be familiar with the themes as recurring parts of the discourse. The rhetorical analysis then consists of relating the themes to the different stakeholder groups. Themes that are drawn on by only one group reflect world views and may be very limited in the degree to which they reflect shared understandings, while other themes that are drawn on by many groups may reflect shared understandings that can be the basis of conflict management and compromise.

Different groups will also give themes particular rhetorical shapes that reflect their understandings and interest rhetorical usage. This is reflected both in the choice of facts that the group emphasizes and different ways of drawing boundaries around facts, values and their implications. The rhetorical use of themes is also directly related to the ways that different stakeholder groups generate social power to help them achieve their goals. Facts and values can act as unifying symbols for some groups, particularly those that draw their power mainly from the solidarity of their members. Environmental groups are a common example. Other groups will emphasize differences between experts and expertise and non-experts. This is especially true of groups that draw their power from knowledge and prestige. Scientists are a common example. Other groups that draw power from money or authority (businesses and

government agencies, for example) will often emphasize the technical and legal aspects of the conflicts, trying to define them in simple ways that sets of rules can easily address.

1.3 The Methodology Used in the Preparation of the Discourse Analyses

Carrying out six different discourse analyses in a single project was methodologically challenging. It required a complex balance between finding information that fits the goals of FRAP as a whole while staying sensitive to local nuances. The approach we chose to address this problem was a series of visits by the Work Package Coordinator to each local case.

The basic steps were fairly straight forward. First an initial series of key informant interviews was done with officials in each model region who represent both relevant government ministries and local stakeholders with non-governmental organisations. These interviews identified the primary local stakeholder groups and got a sense of their positions. These interviews were carried out before the visits by the work package coordinator.

For the purposes of Work Package Six we defined "stakeholder" in a specific way that was not meant to be synonymous with the term "stakeholder" as it appeared in other project documents and work packages. Rather "stakeholder" was defined in a way that was meant to facilitate sociological analysis. A stakeholder is a group of people that are likely to be able to influence the content or effectiveness of relevant policy. This includes government agencies at various levels, environmental groups, fishers, local businesses, such as those related to tourism, etc. Local stakeholders wield such influence either by participating in the creation of the policy or by helping or hindering its actual implementation. In other words, if an environmental group or a local business group has the possibility of having influence on either how a policy is legally defined or on how an enforcement agency is going to interpret that legal definition, then that group is a stakeholder. Furthermore, if fishers have a possibility of going out an shooting a vertebrate with a good chance at getting away with this, then they are stakeholders by this definition because they can have a definite negative impact on the effective implementation of a policy, even if they do not have much influence on what the policy says in some document or how it is interpreted by a local agency.

Next, a larger set of interviews was carried out with a group of these stakeholders. One of the two main tasks of the Work Package Coordinator's visit was to work with the local team in identifying the stakeholders to be interviewed. This was done across two dimensions: the first was the various stakeholder groups and the second was the scale (local, regional, national) on which the stakeholder group operated. This group of interview respondents was not meant to be a *sample* in the sense of a sufficiently large number to be able to characterise the opinions of the different groups and get any idea of the spread of these opinions within the overall population of the "interested public" i.e. the sub-set of the general public that is actively interested in these issues. The intent of a discourse analysis, in fact, is to describe the shared meanings and understandings that the various stakeholder groups draw on in their discussions. The discourse analysis does not describe the opinions that people hold, or anything else that is found in people's heads, it describes a shared, social phenomenon that allows communication. Rather than seeking enough interview respondents to be able to explain the distribution of opinions, the discourse analysis seeks enough interview respondents to cover the shared understands. This means in practice that the research continues the interviews until he or she stops hearing new ways of characterising the issues. In fact, researchers who do wish to describe the distribution of opinions have to do a discourse analysis first in order to be able to write the questions that can then be administered to a sufficiently large random sample of the population they wish to characterise. As we were doing the discourse analysis as a step in building a participatory process we had no need to characterise any populations in this way.

The interviews were semi-structured, meaning that rather than using a specific and standardized set of questions, a set of "topic guidelines" was created. This was the second main task of the Work Package Coordinator's visit. The interviews took the form of guided conversations in which respondents were encouraged to define the issues in the terms they actually see them in, rather than having the content of the issue defined by specific questions. Interviewers used the topic guidelines simply to make sure that the conversation has covered all the desired topics. Some specific questions were used in this method, but were saved to the end of the conversation so that they did not bias the growing understanding of the terms that the respondent used in discussing the issues.

The topic guidelines broadly included the following topics: a) the interactions between the fishery and the protected vertebrates; b) the scientific information about the interactions; c) the interests and activities of their own and other local stakeholder groups in relation to the interactions; and d) the strengths and weaknesses of the various mitigation efforts either being used or under discussion.

The third major task of the Work Package Coordinator visits was training each country team in a "grounded theory" analysis using the Nud*ist textual analysis system. A discourse analysis is a simple sociological theory that describes the socially shared understandings of stakeholders about a set of issues. Grounded theory (Glaser and Stauss 1967) is a general method of comparative analysis which builds theory through interaction with qualitative data. Sociological theory, Glaser and Strauss (1967) argue must be able to "fit", i.e, - the categories that the theories use must be readily applicable to the data under study and it must "work" which means it must be relevant to and explain the behaviour under study. In our case this behaviour is what stakeholders say about the set of issues we are interested. To do a job like this, the inductive approach of grounded theory is much more applicable that the alternative logical-deductive approach.

It turned out to be very helpful to think about this task in terms of the classical concepts of "inductive" and "deductive" reasoning. Inductive reasoning is reasoning from parts to a whole while deductive reasoning is reasoning from a whole to parts. In inductive reasoning abstract categories are built up from specific things. In deductive reasoning specific things are placed in already existing abstract categories. Nud*ist builds grounded theory by creating a hierarchy of concepts in the shape of an inverted tree where large categories contain smaller categories. The categories then attach to particular pieces of text from the interviews. Using Nud*ist to do discourse analysis involved self-consciously doing both things simultaneously within the interview indexing process.

All of the teams trying to analyse their particular case began with important deductive, theoretical categories. For example, they all shared the theory that stakeholders are important and they all used words like "fishers" "environmentalist" or "government official" to name deductive categories. The larger categories were created and then more and more specific categories were used to give more details.

At the same time inductive categories were create from the content of the statements made in the interviews. This is where the true grounded theory was carried out. We did this by looking at the statements that people are making in interviews, thinking intuitively about what other statements people are making that are similar, and then putting these things together by naming a new category. The teams created these categories while they were actually doing the indexing of the interviews into the category "tree". When found another respondent making a statement that fits in this category they placed that statement under that category. So inductive categories in the Nud*ist tree were created in the "opposite direction" from the deductive categories discussed in the last paragraph from right to left in the node explorer. The more detailed categories were invented first and the larger categories were created by grouping them together. Researchers did both of these jobs at the same time when they were indexing their interviews. They placed each interviews statement in the appropriate deductive categories while are using the interview statements to create or expand new inductive categories.

One example comes from Denmark. In an interview in Denmark a fisher made the argument that the "painting eggs makes the fishers feel better even if it does not have any real effect on cormorant populations". This text unit was then indexed under the deductive categories of "fisher", "mitigation measures" and "cormorants". It was also indexed under a new node called "painting eggs makes fishers feel better" which lead to the creation of a new node called "psychological effects of mitigation policies" which lead to the creation of "political reasons for policies".

When they had finished the indexing of interviews, then these inductive categories, particularly ones that are shared by several respondents, were the discourse analysis. The deductive categories, then, were what allowed them to describe the different ways that people drew on the discourse. To use another way of speaking, the deductive categories were your independent, explanatory variables and the inductive categories are your dependent variables to be explained.

The most important step of the analysis was the identification of the "themes".

1.4 Reporting the Discourse Analysis

The first step in doing the analysis was to look over the concept tree and identify the main themes. Then for each theme a paragraph was produced describing the set of things people believe are facts (the question of whether or not these facts are true facts is not relevant here), the values and interests that people link to these facts. These need to fit together as a coherent story line. After you have written this paragraph then a name was given to the theme. This was a descriptive name that was in the form of an "assertion", meaning a statement that can be agreed or disagreed with. The reason for making these names in the form of assertions was to make sure that the themes are comparable with each other and can be analysed the same way. For the sake of the analysis we had to find a way to make sure that themes were all pointing at the same kind of thing. Otherwise, even though the teams had a good idea what the main themes in their analysis were, the names would be all kinds of different things. One theme, for example, could be called "ethics" while another could be called "the population of cormorants" while a third would be called "seals are pests". In this example only the third theme "seals are pests" is really a properly named theme and the others would have to be renamed to reflect their assertive content. Ethics would, likely need to be divided into several themes such as "it perspective unethical to hunt seals" or "it is unethical to protect seals at the expense of fishers' livelihoods". Also "the population of cormorants" would need to be change to something like "the population of cormorants is too large". Themes, however, are much larger than just their names. The name is a summary, it should be the most important, representative, and central assertion within a theme, but it is not the entire theme. The entire theme is the whole linked together set of facts, values and interests described in the paragraph.

The next step was to create a graphical presentation in four parts. These graphical presentations make up the bulk of the present report. The first part is the presentation of the discourse from the perspective of all stakeholders. The second part was the presentation of the discourse from the perspective of individual stakeholders, or groups of stakeholders that see things the same way. The third and fourth parts, which were added later after an initial presentation of the results, were the same exercise but using specific management measures instead of themes.

In each presentation, the Y axis is the frequency with which the theme is drawn upon. For example for a theme which one stakeholder mentioned once in one interview, the name of the theme, would be against the bottom of the graphic, while a theme that many stakeholders mention often would be against the top. The X axis is the importance of the theme for conflict management. If all stakeholders see the theme as a minor one having limited implications for how the conflict should be handled then it is placed close to the left side of the graphic. If all stakeholders see the theme as a critical issue then it goes to toward the right hand side. If stakeholders are divided in the importance they see it would be placed toward the middle. The third dimension, usually represented by colours, is the degree to which the theme is contested. If most stakeholders basically agree with the theme (and here is made clear the importance of naming the theme in the form of an assertion) the name of the theme will be in one colour. If the theme is highly contentious the name is written in another colour. Other graphics communicate specific stakeholder perspectives. Each country team had to decide how many of these you need to make. When the analyses by each country team were completed the most important difference related to the number of stakeholders and the level of aggregation of the stakeholder analysis which was need to capture the different ways that the stakeholder drew on the theme.

The products are the central content of the reports included in the following chapters. The outline of the final country reports for Deliverable Nine is as follows:

1. Introduction
    a. Historical description of conflict
    b. Description of existing mitigation measures/management plans
    c. Description of the themes
2. Variation of opinions among stakeholder
    a. By themes
        i. A graph frequency, importance, agreement with the theme
            (1) one graph for each 'stakeholder' meaning as many graphs as useful to show variation with stakeholder groups,
        ii. textual description of the most important patterns in graphs
    b. By management options
        i. frequency, importance, agreement graph for main stakeholder groups
        ii. textual description of the most important patterns in graphs
3. Aggregation of opinions –a single picture of the overall discourse.
    a. A graphic presentation by themes frequency, importance, agreement (with each other). One graph for main stakeholder groups
    b. A graphic presentation by management options
    c. A textual description of the most important patterns in graphs
4. Alignment of Stakeholders
    a. A graphic presentation showing how the stakeholders cluster with each other for both themes and management options
    b. A textual description of the most important patterns in graph
5. Conclusions
    a. Where would further knowledge be helpful
    b. Implications for RAP
    c. Possible lessons that can be generalized to other cases

The next six chapters of this document are the discourse analyses from the various model regions in alphabetical order by country. Most of the chapters followed this outline, a few country teams felt that some deviations served their local situation best and the work package coordination team felt that this was all to the best. The Swedish team, in particular, added a number of their own theoretical insights, which add to the overall richness of the discourse analysis. Sufficient commonality emerged that some simply comparisons between the model regions were possible, and these are reported in the final chapter along with a discussion of what we felt were the most important 'take home lessons' from each of the model regions.

2 DENMARK – cormorants management and fisheries conflicts

2.1 Introduction

This introduction serves the purpose of presenting a historical description of the conflicts related to management of cormorants and how the management instruments have evolved along with the conflict. The reason behind the use of the term conflict is that the protection of cormorant in Denmark is a contested issue. The conflict is driven by different stakeholders disagreeing strongly on most aspects related to cormorants; what is the role of cormorants in the nature, how they impact fisheries, how and to what degree the population should be regulated etc. The division of stakeholders according to their positioning in the conflict is basically between fishermen claiming that cormorants impact their livelihood negatively, anglers who fear for the regeneration of endangered fish stocks due to cormorant predation or people acknowledging these claims. The opposing grouping of stakeholders are environmentalists and ornithologists who are of the opinion that the negative impacts of cormorants have not been sufficiently documented and that the cormorant has become a scapegoat for a general environmental degradation taking place and people supportive of this view. In between these two groups we find the authorities who are involved or responsible for management. The following is a crude division of stakeholders.

Group of stakeholders who are negative towards cormorants and the current management situation	**Group of stakeholders attempting neutrality as a result of their position**	**Group of stakeholders who are positive towards cormorants and resisting management of cormorants**
Pound net fishers	Public administrators	Ornithologists
Recreational fishers/anglers	Forest and Nature Agency	Environmentalist
National fisheries association	State Forest Districts	
National anglers association	Researchers	
National fisheries environmentalist	National Hunters Association	
Tourism-interests (angling and coastal tourism)		

From a protection point of view the national protection of the cormorant in 1980, followed by the EC-wide protection based on the Directive on Conservation of Wild Birds (Directive 79/409/EEC) in 1981, has been a tremendous success. The population in Denmark increased from approximately 3,000 breeding couples in 1980 to approximately 37,000 breeding couples in 1994. Since 1994 the population has stabilised on this level (36-40.000). For those experiencing the increased population as a problem, which are primarily pound net fishers and recreational fishers it is difficult to see this development as a success. This has resulted in many complaints and large disputes about management of cormorants over the years and the evolvement of the management of cormorants reflects this.

Development of the conflict historically

Historically the cormorant in Denmark has been exposed to heavy regulation, which resulted in the cormorant being absent as breeding specie for a period of approximately 60 years from the 1870's until 1938 due to excessive hunting. The return of the cormorant was a result of both improved conditions in countries south of Denmark and a reduction of the hunting season for cormorants from a year-round hunting season to protecting the species in the breeding season taking place in 1931. Several colonies were formed and the population increased rapidly. However, along with the population growth the population reduction pressure increased as well and in 1972 there was only one colony left in Denmark with approximately 300 breeding couples situated in a nature reserve. The size of the colony was the result of an agreement made between Ministry of Fisheries and the Conservation Council made in the 1950's due to demands from the local fishers that the population was not to exceed 200 couples. In 1972 this policy was changed and the population control of the colony was stopped (Hald Mortensen, pers. com.).

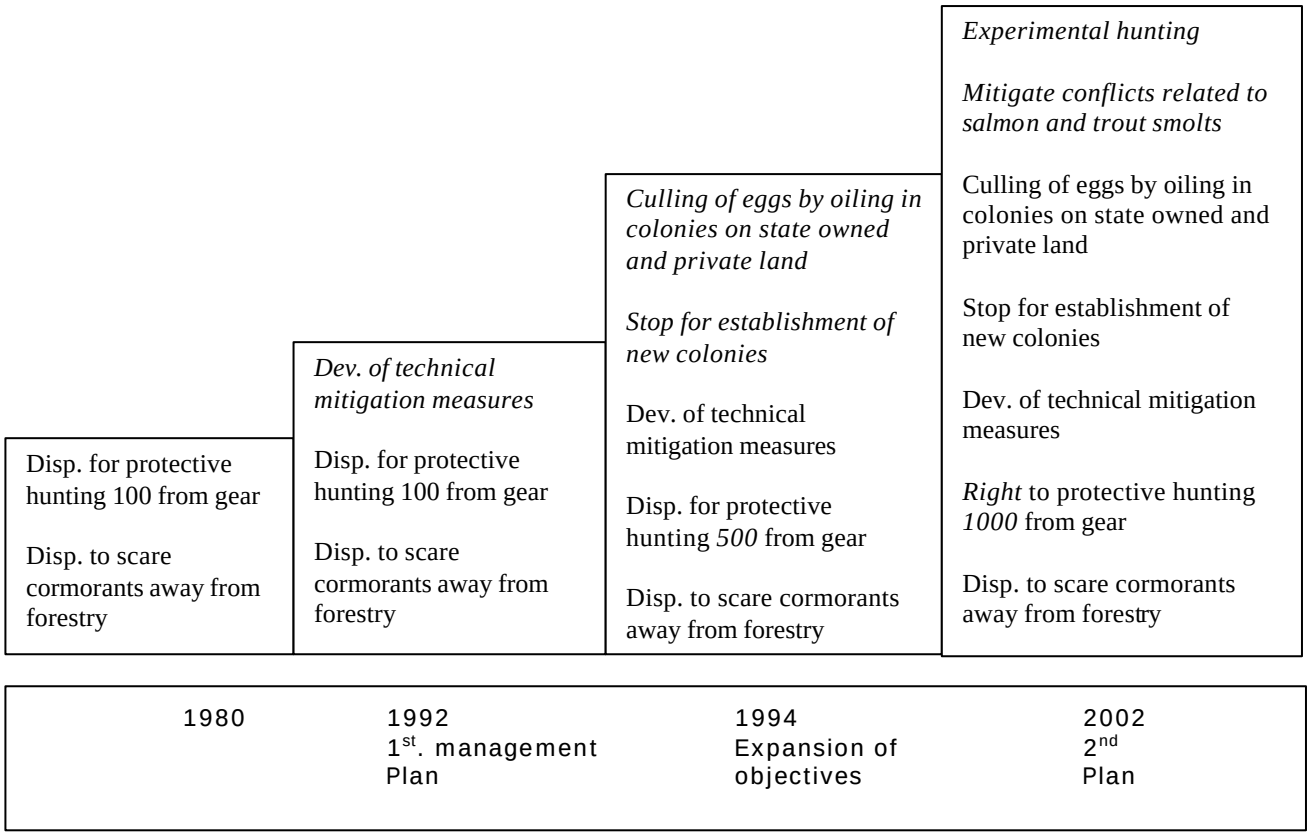
In 1972 when the colony Vorsoe was allowed to expand the immediate result was that two colonies were established the following year in two other areas (Braendegaardssoe and Omoe Today there are 7 colonies with more than 2000 nests and in 2003 there were 49 localities where nesting took place.

In the period from from 1972 to 1979 the hunting regulations changed back and forth until 1980 when the cormorants became protected in Denmark and after this the population started to increase rapidly. (Cormorant Management Plan 2002). Following the protection in 1980 the breeding population rose from 3700 couples in 1982 to 37.700 couples in 1994 and since then the population has stabilized around 36,000-40,000 breeding couples.

Population development impact on regulation

The significant increase from 3000 breeding couples in 1980 to approx. 29,000 couples in 1991 resulted in many complaints from fishers who experienced an increasing problem with cormorants foraging in pound nets and not only eating the catch but also inflicting injuries on the fish left. As a result of these complaints the first Cormorant Management Plan for Denmark was made in 1992. The management plan has been revised three times and the last time was in 2002. The regulatory instruments have expanded during the years and the focus has shifted from protection towards population reduction measures following the growth of the population.

The development in management instruments is roughly the following.



The expansion of instruments in the management plan could be seen as an indication of the regulatory instruments not adequately addressing the conflicts.

The 1992 management plan

The overall principles of the Management Plan of 1992 were in favour of the cormorant. An important principle was that it is as far possible the damages that were to be reduced, not the cormorant. Population reduction measures in terms of killing cormorants should only be allowed if other measures had been tested and failed. Another principle was that the population should be allowed to grow without limits. The regulatory instruments in the 1992 management plan were limited. Fishermen could be granted permission to shoot cormorants within a distance of 100m from their fixed fishing gears year round and scare cormorants away using gas cannons. Dispensations have been given to perform these two regulation measures since 1979 (Forvaltningsplanen for Skarven i Danmark, 1992).

The 1994 changes to the management plan

In 1994 the Minister of the Environment decided on an extension of the guidelines for the administration of the Management Plan for Cormorants. The overall principle of the 1992 Management Plan were maintained. However, the changes were quite significant and management of the population became more active. The most significant were a general stop of establishment of new colonies on state lands and on private land when possible, and population control in selected colonies by culling of eggs as well as an increase of efforts of

developing technical devices to minimize the problems of predation by cormorants in fishing gears.

The 2002 management plan for cormorants

With the 2002 management plan for cormorants the management principles changed towards more population reduction measures. The overall objective of the management plan for cormorants for 2002 is to ensure that the size and distribution of the population of cormorants does not cause unacceptable inconvenience for fisheries at the same time as the protection and survival of the cormorant as a Danish breeding species is taken into consideration. The objectives of the management plan should contribute to:

- ?? Preserve the breeding population of cormorant as an integrated part of the Danish fauna.
- ?? Reduce conflicts between cormorants and the coastal fisheries and freshwater fisheries as well as reduce conflicts with forestry and conservation worthy vegetation.
- ?? Preserve the existence of old colonies as well as colonies in other nature and wildlife reserves.
- ?? To mitigate problems following cormorant predation on natural and restocked salom and trout smolt.

Furthermore the objectives of the management plan are:

- ?? Documentation of damage in relation to time, place, and type of fishery including an assessment of economic losses should be commenced.
- ?? Analyse the effects of technical experiments as far as possible.
- ?? Commence regular exchange of information on the development of the cormorant populations between Denmark, Sweden, Norway, Poland, and Germany to ensure the best possible management of the species.
- ?? Ensure that regulations of cormorants take place in a proper manner from a animal welfare perspective under the control of State Forest Districts.
- ?? Analyse the consequences of the management plan after five years.

The relation between management plans and conflict

The management plan itself can be argued to be a stakeholder representing certain interests. There is no doubt that the objective of conservation has different implications for the conflict than objectives of population control. The 1992 management plan straightforward stated that the cormorant did not constitute a problem and that the different stakeholders had to adjust to the presence of the cormorant not the opposite way around. This fuelled the conflict more as those complaining were largely ignored. The expansion of the management plan in 1994 was largely a result from political pressure in parliament but could also be seen a shift from an ideological management towards a more pragmatic one.

Type of instruments

<u>Stop expansion of cormorant colonies by obstructing establishment of new colonies</u>

Since 1994 it has been the policy to obstruct establishment of new colonies. On state owned land, this is a responsibility of the regional State Forest District. On privately owned land new colonies can still be established but in 1994 all private land owners were given a dispensation

option allowing them to kill up to five cormorants when obstructing the establishment of a colony. A common action is to take down nests.

Population control (culling through oiling of eggs)

Oiling of eggs is applicable when nesting is done on the ground and therefore this instrument is limited to a number of colonies. In 2003 oiling of eggs took place in 10 colonies in 8 State Forest Districts and hatching of eggs were prevented in a total of 4.742 nests. This was 27% increase in the number of regulated nests compared to 2002. Oiling of eggs has been a possibility since 1994 the effect is long term not immediately observable due to the fact that the actual size of the population of young not yet nesting cormorants is uncertain, and that e.g. food shortage as well influence the number of cormorants getting on their wings. In 2002 approximately 3000 nests were culled by oiling and in 2003 the number of nests culled increased to 4600.

Protective hunting within 1000m of fixed fishing gears

Protective hunting was one of the first instruments available and was part of the first management plan. In 1992 commercial fishermen could apply for dispensation to kill cormorants within 100m of fixed fishing gears year round. Later in 1997 this limit was expanded to 500m, in 2002 the zone was expanded to 1000m and the season was reduced by four months. The right to protective hunting was made possible for all owners of fixed gears commercial as well as recreational without dispensation requirements. The fishermen have the possibility of handing out licenses for this particular type of regulation to a number of hunters. Dispensations can be given by the State Forest Districts for both population reduction measures in the breeding season as well as within nature reserves if the purpose is to reduce conflicts between cormorants and fishers or to limit the expansion of cormorant colonies into areas with other bird species.

Experimental seasonal hunting (evaluation of a hunting season as regulation instrument)

The reintroduction of a hunting season for cormorants is often being used as an argument when the discourse is that the cormorant population is too large. Being a protected species and being regulated by EU law a general hunting season is not an option without changing EU legislation. In the 2002 management plan a controlled experimental hunting was allowed in one area in Western Jutland. The motivation behind this experiment was to investigate the claims by several stakeholders of hunting being a suitable instrument to control the population.

Use of net coverings to reduce cormorant predation in pound nets

The importance of net coverings as a mitigation measure has been stressed in the management plan since 1992. There is strong disagreement about the effectiveness of net coverings as instruments. The fishers interviewed all state that net coverings are very unpractical to work with, that the cormorants just enter the pound net under water and that coverings are not the solution to their problems. On the other hand net coverings are used by some pound net fishers claiming that net coverings have a positive effect and that they would have been forced out of the fishery if not using those.

Many pound net fishers do use some types of coverings in the pound net in specific fisheries. In the herring fishery some fishers use to divide the pound with a large mesh size net making it impossible for the cormorant to chase the herring round the net and injure and stress them to death. In the eel fishery one informant blocks the entrance of the pound net with a small mesh size net, letting eel enter and leaving out cormorants as well as other fish species. These types of covering can therefore only be used in areas and in periods with specific fisheries and not in areas with mixed fishery.

Use of sound devices to scare off cormorants

Although mentioned in the management plan sound devices are very seldom used as mitigation measures. The main reasons are the claims that the effectiveness is very low.

No compensation schemes

There are no compensation schemes available in relation to cormorants.

Type and number of stakeholders interviewed

21 Semi-structured interviews have been conducted and the following analysis was validated in a workshop with several informants and key informants. The following stakeholders have been interviewed.

Pound net fishers (5)	Public administrators (1)
Recreational fishers/anglers (3)	Forest and Nature Agency (1)
National fisheries association (1)	State Forest Districts (2)
National anglers association (1)	Researchers (1)
National fisheries environmentalist (1)	National Hunters Association (1)
Tourism-interests (angling and coastal tourism) (2)	Environmentalist (1)
	Ornithologists (1)

(Numbers in parenthesis are number of informants interviewed. In addition 3 key informants (1 pound net fisher and 2 researchers) were informally interviewed several times).

The stakeholders represent the following organisations and institutions.

- ?? Danish Ornithological Association
- ?? National Hunters Association
- ?? Danish Fisheries Association
- ?? Local recreational fisheries associations
- ?? Pound net fishers
- ?? The Forest and Nature Agency
- ?? State Forest Districts
- ?? Directorate of Fisheries*
- ?? Danish Anglers Association
- ?? The Living Sea Association
- ?? Tourism interests
- ?? The Danish Nature Council
- ?? Danish Center for Wild Salmon
- ?? National Environmental Research Institute*
- ?? Danish Institute for Fisheries Research*
- ?? Animal Welfare Association*

*Formal semi-structured interviews have not been conducted with these stakeholders, but they have contributed either as key informants and/or participated in workshop.
6 municipalities and 1 county declined to be interviewed, as they were of the opinion that they had no stake in the conflict. Based on interviews with local key informants two pound net fishers were selected from each research area. One pound net fisher outside the research areas was selected because of experiences with protective hunting.

Main storylines from Danish stakeholders

Based on 21 interviews with various stakeholders the following storylines have been extracted to describe the central conflicts and themes in the discourse on cormorants management in Denmark. The typical themes being touched upon in the interviews and the issues that respondents find most important concern: 1) the legitimacy of management; 2) the use of knowledge in management decisions; 3) the various regulation measures and the efficiency of these; 4) the perception of nature; 5) the economic and ecological impact of a growing cormorant population and 6) the exactness of biological data.
Each of these themes is broad and contains a number of issues. The storyline is an extract of the theme, titled with a typical statement describing what has been identified as being the core issue and the content of the conflict.

1) Managers should listen more closely to stakeholders

The interviews touch on the subject of legitimacy of fisheries and cormorants management. This is typically expressed in how stakeholders perceive their role and level of influence on management decisions. It is generally seen as the administrations responsibility to consult and involve the varying viewpoints and recommendations, however the experience of being heard and consulted by the managers differs across the group of stakeholders.
It appears from the interviews that all stakeholders share the perception that environmentalists (e.g. ornithologists) have had more influence on the initial and following management plan. Particularly commercial fishers and their national association are dissatisfied with not being taken seriously by decision makers. Dissatisfaction origins from the making of the first management plan in 1992 but still influences the attitude towards managers. Fishers feel victimized by a public perception of nature as something that must be conserved and protected even if it means the costs of fishermen's livelihoods. Fishers find this expressed in a dominance of cormorant-friendly officials (typically biologists) working in public administrations and not being willing to involve commercial fishers.

> *"Much is being produced on paper. It's my impression that nobody wants to listen to the people on the floor"* (Pound net fisher)

The perception of commercial fishers being shut out from influence is shared by several stakeholders, who believe this is happening because pound net fishers are merely a weak subgroup within the national fisheries organisation. Others stakeholders believe the absence of commercial fishermen in decision making is because of lack of scientific evidence supporting the fishers' claims.

The National Ornithological Association is aware that they play a central role in the management of cormorants, and to some degree take the credit for the successful protection. The Association perceive themselves as the safeguard against cormorant management being driven by populist opinions.

> *"I believe we have had a very large influence in particular with the cormorant. I believe that if we had not been there to safeguard sound principles or common sense the cormorant would not have come back. Or it would not have been protected properly" (The National Ornithological Association)*

Despite fishers resignation towards management there is some agreement among stakeholders, that managers (Danish Forest and Nature Agency – SNS) are becoming better listeners. Align with this the administrators also experience they putting more effort into involving stakeholders via correspondence, group meetings, and public meetings

> *"During the recent years we have become better listeners and are now more active on local scale"* (Official at SNS)

In particular anglers have experienced that an increasing listening from public administrations.

Overall, administrators claim that it is not their decision who should and who should not be heard in decision making – it is a political decision beyond the influence of governmental officials.

2) Individual observations and oral reports are not reliable data

The theme legitimacy is closely linked to the use of knowledge in management decisions. Managers and several stakeholders depend on the availability of scientific data and documentation of problems for in decision makings and negotiations. Depending on what research is being carried out and being funding, the stakeholders are given different possibilities to document their problems and hereby influence decision-making.

An important issue is the interpretation and use of data. Several of the fishermen interviewed, feel their knowledge about the eco system and cormorants is not being seen as valuable. They experience, what they call, common sense as something not being respected by managers. Fishers feel they have to repeat their arguments about financial loses from cormorants biting and birds damaging their catch. Fishers claim it would be easy to make biting surveys demonstrating the extent of the problem and that administrators (SNS) should be responsible for such surveys. Fishers feel that ornithologists and biologists in government positions have misinformed decision makers. They are merely seen as experts manipulating with data and with no interest in uncovering the "real" extent of the conflict because they have no personal economic interest in fisheries but have a clear preference for cormorants.

> *"People in administration have manipulated with things…. to a large extent ministers have been misinformed"* (Commercial fishers)

The key issue in the knowledge debate is to what degree the cormorants constitute a problem to fishermen. Ornithologist and environmentalists acknowledge that cormorants may cause local damages to pound net fishers but at the same time the ornithological association and the environmental NGO state that there is no documentation supporting the claims of widespread problems and they consider these claims to be more emotional and political than factual.

"In the public debate the extent of damages caused by cormorants has been wildly exaggerated" (Environmental NGO)

On the other hand researchers who have investigated different aspects of cormorant predation claim that important impacts of cormorants on pound net fisheries and fish stocks are sufficiently documented. However, some stakeholders see these findings as a one-eyed presentation of knowledge by ornithologist and environmentalists who deliberately suppress knowledge.

"*when they are worst the ornithologists almost tend to deny facts*" (Researcher)

This knowledge together with the claims from fishermen are not sufficient for managers. The administrators in charge of implementing the management plan find it difficult to base any decisions on non-scientific information. They agree with fishers that individual opinions and experiences should be considered valid information. They also state that no matter which organisation, well documented facts/surveys are necessary to gain influence in the management system.

The research institution that stakeholders have the most confidence in is the National Environmental Research Institute (NERI). However much research is respected including the surveys conducted by NGO's like the Ornithologists Association. The Danish Fishersmen's Association is often pointed out (by managers and opponents) as an opportunistic organisation with lack of scientific evidence supporting their demands.

Fishers are not the only disappointed stakeholders. Environmentalists state that recent increases in cormorants regulation is a result of a politic-based instead of a knowledge-based management approach whereas fishers and anglers see the change as a result of environmentalists loosing influence on management and that alternative knowledge and reasoning is now being considered in management-decisions.

3) The cormorants should be controlled

In most interviews the stakeholders perception of nature is a central issue influencing how regulations are perceived. How should nature be regulated? Should it be regulated at all? Are cormorants a pest or a value?

Common for all stakeholders is that they acknowledge cormorants as a part of the Danish fauna, however there are great differences their view of nature the biological role of cormorants.

Most stakeholders interviewed are in varying degrees users of nature as they are all regularly outdoor either due to work or to recreational activities. Ornithologists and anglers e.g. stress that they are users of nature in their own way and that this adds to the weight of their respective arguments. Commercial fishers add on the economical dimension that economical dependency and livelihoods being under pressure give arguments even more weight.

There is a distinction between stakeholders having a utility-oriented perception of nature and those with a more romantic-oriented perception preferring nature to regulate it self without any interference. The commercial fishers basically see the cormorants as a competitor with little value except to bird watchers. Other non-fisheries stakeholders also find it reasonable to regulate cormorants as most of Danish nature is regulated in order not to distort ecological processes.

> *"There is great opposition among ornithologist* [to regulation], *many would prefer the populations to regulate themselves, however this is unrealistic in Denmark"* (part-time commercial fisher).

Contrary to this point of view several stakeholders would prefer if the cormorant was left alone to regulate it self

> *"My ideal is that the regulation of cormorants should stop so nature can regulate itself"* (Environmental NGO representative)

Related to the discussion of whether cormorants should be regulated or not are the principles of regulation. Stakeholders have varying perception on whether it is practically possible to conduct an exact regulation of cormorants.

Several stakeholders are in favour of a reduction of the population and in particular fishers and recreational fishers prefer the population dramatically reduced. A biological research stakeholder suggests a halving of the population in order improve conditions for both fishers and cormorants. Ornithologists, environmentalist and some manager stakeholders find the population to be stabile and see no reason to regulate. Nevertheless these stakeholders acknowledge the existence of local conflicts but believe that this is can be solved within the current management plan.

Among ornithologist and managers the idea of having a fixed number of breeding couples or a specific population size as a management principle and is opposed. According to officials in the SNS this is an unrealistic approach only leading to new factual conflicts instead of critical discussions on how to solve the existing local conflicts. The Danish Fishermen's Association (DFA) share this point of view point and suggest that populations may be reduced extensively in certain areas and left undisturbed in selected areas. According to the DFA this would change focus from managing the number of birds to managing habitats. However biologists claim this is unrealistic as cormorants migrate and forage in larger areas - on average 20-30 km (biologist have documented distances up to 70 km from breeding habitats).

The National Hunters Association have no interest in shooting cormorants, but argue that cormorants may be regulated from the perspective that other bird species are regulated in order to avoid an uncontrollable populations.

> *"I think, in a cultivated country like Denmark you need to take a stand about how many cormorants we want here"* (Hunters Association)

Those economically dependent on the natural resources, with or without cormorants are because of economic circumstances more offensive in the formulation of a regulation plan, while conservationist may be against any regulation. For instance the tourism sector is concerned with the extinction of pound net fishers in coastal communities and thus argue for a strong regulation of cormorants. Cormorants are not considered economically important in terms of bird tourism although several stakeholders generally view the potential of bird tourism as high.

4) It is the cormorants fault that the fishery is closing

Fishers are concerned with reducing the population to a minimum in the specific fishing areas and overall reduce the population to half of its present level. Most fishers perceive it as unreasonable to keep protecting a species which has been growing fast in numbers for the past decades. They see it as the tyranny of conservationists (lobbying in decision making procedures) and as the impact from a highly emotional public debate. They claim that if the people making decisions had any economic input at stake in these fisheries they would understand the frustration and demands of fishers.

> *"I have nothing against cormorants, but they should be brought down to a level where we can all be here"* (pound net fisher)

> *"…if it was their salary that the cormorants were eating I think more people would be interested in reducing the population"* (pound net fisher).

Representatives of SNS and ornithologists believe the population will not increase further beyond the present level and that it will require a strict regulation to reduce it. It's assumed the population is in balance in respect to the existing feeding potential in Danish waters. Officials in SNS are pointing at the paradox of fishers claiming there are no fish at the same time as the cormorant populations are increasing.

> *"fishers say there is no fish, but still there is enough fish to sustain a large cormorant population."* (official in the SNS)

Officials in the SNS believe fishers are exaggerating the economic and biological impact that cormorants have on commercial fisheries. They see it as a pure simplification of an ecological complexity to blame cormorants for the decline in pound net fisheries. The reduction of fishers should be seen in a broad social and economic context and e.g. as a consequence of structural adjustment in Danish fisheries. The latter has not benefited pound net fishers.

Despite different interests, most stakeholders agree that severe local conflicts do exists between fisheries and cormorants and should be dealt with. However the disagreements persist regarding to what extent fishers, tourism, recreation or conservationists should be prioritized and to what extent.

5) There should be more exact information about the cormorant population

Disagreement on the actual size of the population is a common source of conflict among stakeholders. The uncertainty is an opportunity for stakeholders to undermine opponents argument and to question the liability of official studies.

The typical estimates of population sizes are around 35.000-40.000 breeding couples living in Denmark. Some claim this number should be multiplied with as much as 5 or 7 to represent the "real"number of individual birds.

"How much they damage our fishery they don't know" (pound net fisher)

With a strong politication of cormorant management the precision of data is becoming a core instrument in negotiations for all stakeholders why there is need for improvement in this area. No doubt, the impact from a population of 100.000 or of 200.000 birds is very different, however biological research is costly and an increase in expenditures in this field may very likely be contested .

> *"One of the problems is to find the financing. The cormorant is a relevant problem, but it's a conflict which has already received much money"* (represent of SNS)

6) Hunting/shooting is efficient but cannot replace other regulation measures

Hunting, divided between experimental hunting[1] and protective hunting[2], are basic measures taken in the short term management of cormorants. However, there are divergent meanings concerning the efficiency of these measures as cormorants are easily scared and therefore difficult to hunt. Furthermore they reproduce rapidly why a great number of birds most be shot in order to have a significant impact on the population size.

Fishers on the contrary, claim that cormorants must be hunted to keep down the populations and argue that shootings should be permitted throughout the season. Fishers are aware of the public resistance to killing of birds (particularly in larger numbers) and are thus cautious talking about their shootings. As a result of this, misreporting of the number of killings is a common phenomenon.

Generally the fishers disagree with biologists and ornithologists that shooting only has minor impact on the population. Although, no fisher believe shootings can replace other measures they strongly argue to keep and expand this measure. Both fishers and non-fishers point to the psychological effect of allowing killings of what many fishers see as their worst enemy – in a way killings are muting the conflicts and perhaps strengthening the legitimacy of management.

Biologist and ornithologists argue that the individuals surviving hunting will adapt by breeding at an even earlier age. According to biological experts and even to the Hunters Association painting of the eggs is more efficient in population control. Also the political problems related to killing of cormorants, with no use of the meat, have made the Hunters Association step back from choosing cormorants as a target species. The Association fear they will be accused of *immoral* killings. If the Hunters Association choose cormorants as a target species it may be at the expense of other target species as the Danish Ornithologist Association (DOF) will argue that shootings of cormorants must be instead of other vulnerable species.

[1] Seasonal hunting is implemented as an experiment in the Fjord of Ringkoebing – elsewhere protective hunting is the only legal form of hunting)
[2] Protective hunting is limited to certain seasons and to certain areas (see introduction of this chapter for more details!)

7) Painting the eggs is the most human measure

Several stakeholders, including recreational fishers, Hunters Association, public administrators, and the tourism sector perceive painting of eggs as the most human mitigation measure. The tensioned debate about cormorants is pressuring stakeholders to comply with "strong" ethics regarding killing of animals. Most stakeholders seek to avoid the situation of having to defend shootings of e.g. thousands of cormorants (in case this was known to the public through media). Painting of eggs is generally accepted by the public. Even among commercial fishers, who generally see shooting as a useful tool, one finds agreement with painting of eggs as being the most human measure. However, fishers are generally discouraged by the public resistance to shootings and see painting of eggs as an expression of the "soft" conservationist friendly management approach.

> *"It is the way to do it, and it is also the most human measure"* (pound net fisher)

Among critics of regulation like the ornithologists and the recreational fishers an often heard question is who should paint the eggs and who should pay for it? The measure is perceived as being too expensive and time consuming.

> *"It is unacceptable to paint 2000 eggs and choke the chicks and use hundred of thousands of public money on something that has no real effect"* (Ornithologists)

> *"Painting the eggs is just to give impression of a successful management"*. (National Fisheries Environmentalists)

Although painting of eggs is a costly measure it will likely remain a cornerstone in the Danish cormorant regulation. Alternative mitigation measures like net coverings and stressing of the birds (sound) are, according to fishers and anglers, inefficient in the long term.

Generally there is support among stakeholders to work with several measures simultaneously, including painting of eggs.

8) When you see cormorants eating a lot of smolt it makes you angry

Smolt is considered a relatively easy catch for cormorants especially when they are released. This is creating some substantial local conflicts

> *"They were out releasing salmon smolt and they thought there were no cormorants, when they came back later with a new portion of smolt the water was covered with cormorants and they couldn't scared them off. So it is not only the commercial fishers who have problems"*. (Pound net fisher)

It is estimated that more than 400.000 smolt individuals (mostly salmon) are released each year The Danish Center for Wild Salmon claim that locally more than a third of the release is eaten by cormorants, thus reducing the potential benefits of smolt. The government is subsidizing smolt releases and it is also with some concern that public administrators experience how cormorants are impacting these initiatives. No stakeholders express disagreement with the recreational fisher's complaints concerning cormorants.

Recreational and commercial fishers are the most active in promoting a local and seasonal regulations in order to solve the smolt conflict. The commercial fishers have no direct interest in salmon smolt (they target other species) but have a strong incentive to ally with the recreational fishers as the latter have far greater influence on decisions makers. The great number of people practicing recreational fishery is making this group a powerful voice that politicians listen to. In comparison the commercial fishers are still the most aggressive in their arguments. The recreational fishers are basically interested in a seasonal regulation (hunting, scaring) during the smolt release, but also support a long term regulation with painting of eggs.

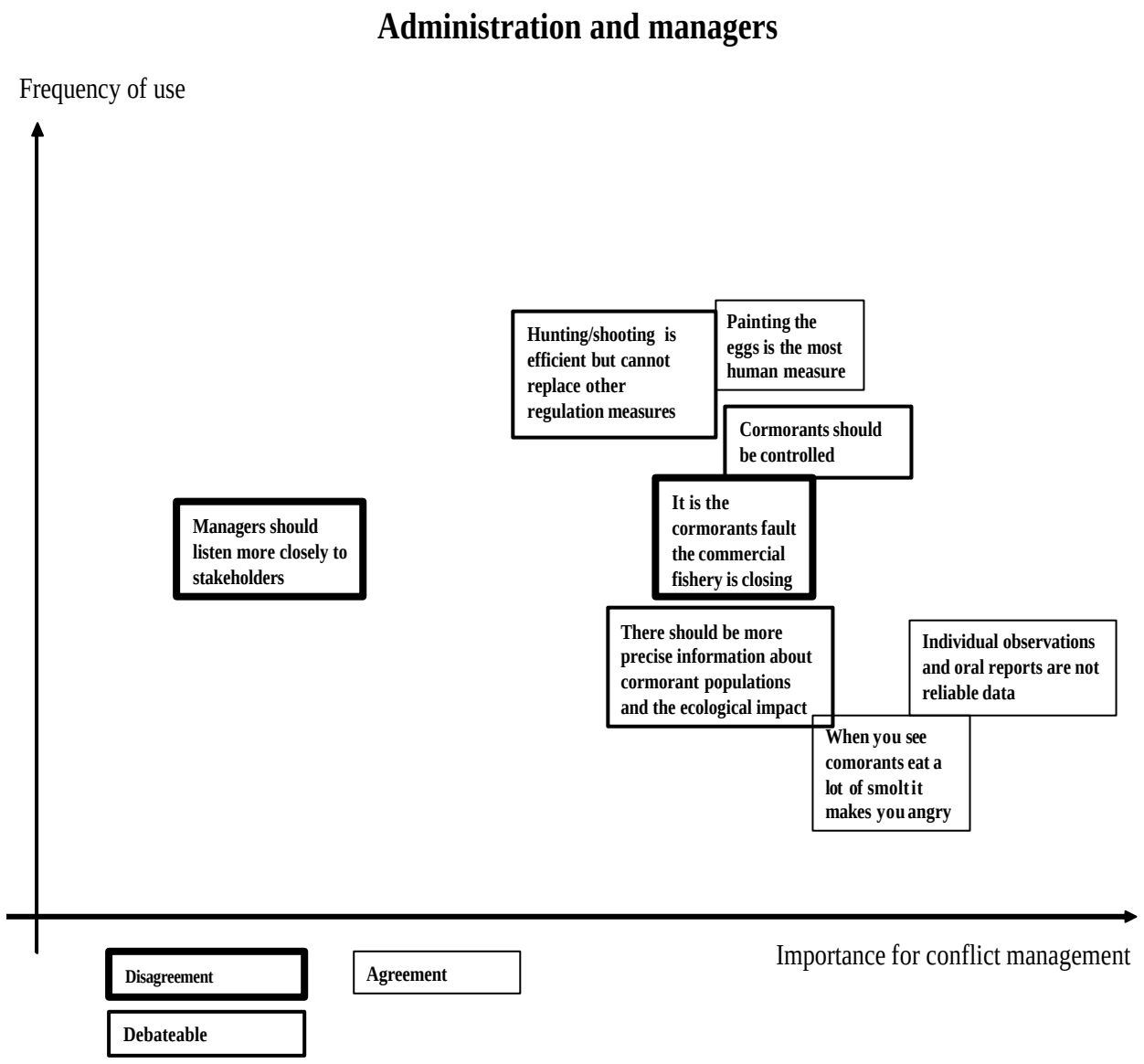
> *"Even the ornithologists are surprised about how much of the cormorants food that consists of smolt"* (planner of recreational tourism)

The only really critical voice about smolt release is a biologist who state that much of problem would be reduced if only smolts were released during night instead of daytime.

2.2 Variations of opinions among stakeholders

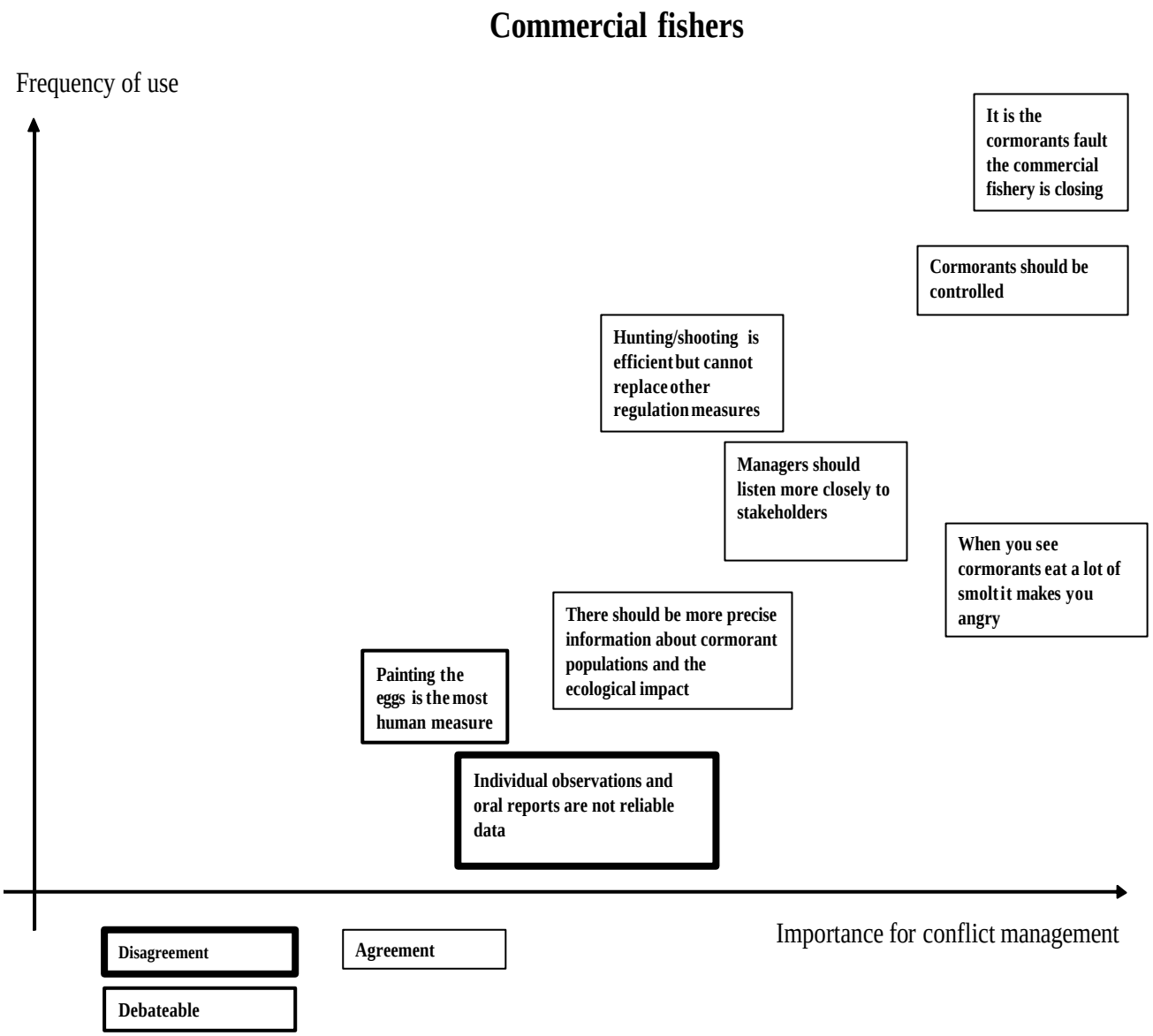
2.2.1 Variations of opinions among stakeholders by storylines

The following graphs reflect the respective stakeholder group's opinions about storylines.

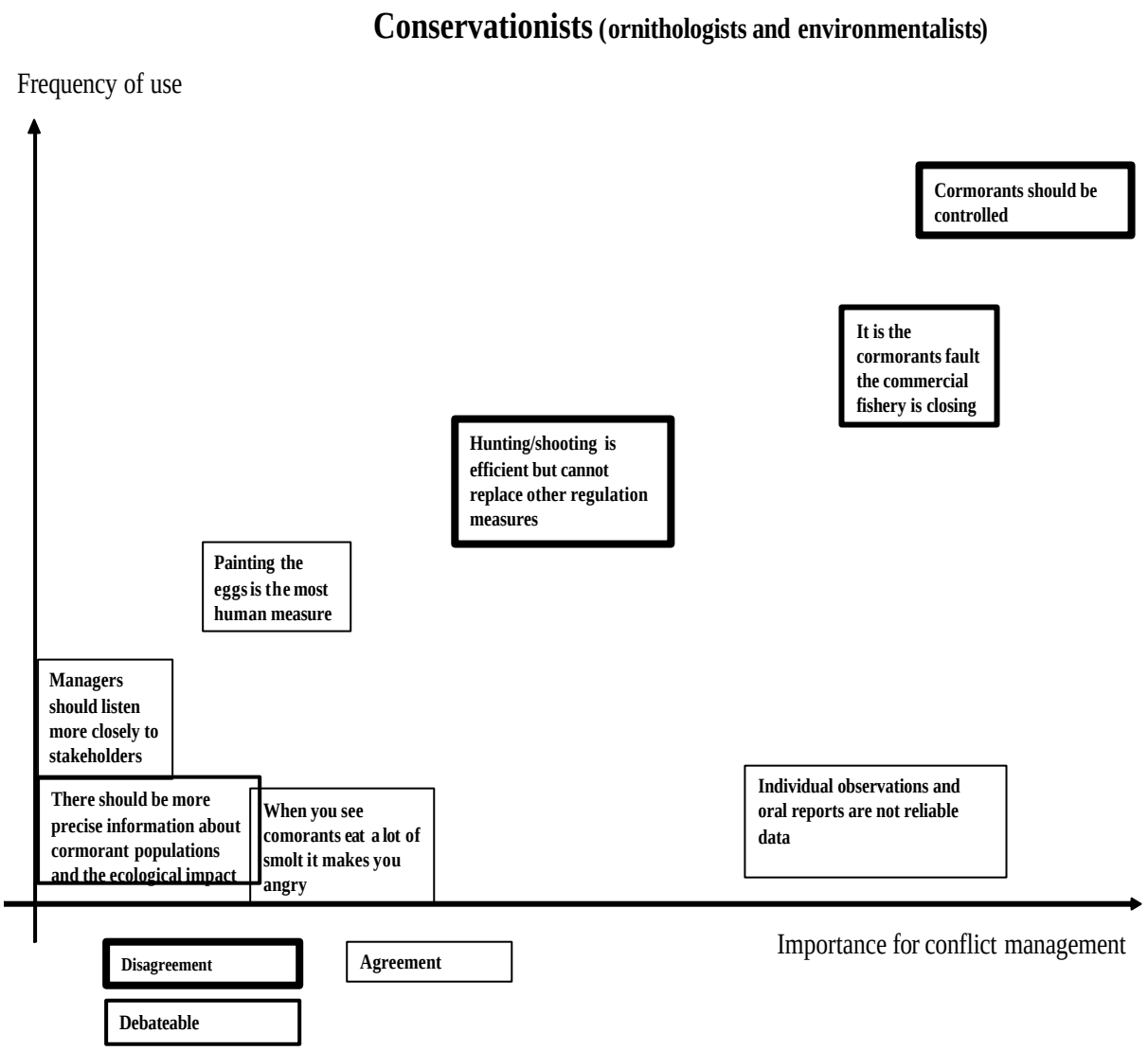


Administration and managers include public administration (county adm.), Forest and Nature Agency, State Forrest Districts. Overall administrators disagree with the storyline that managers should listen more close to stakeholders. Administration is principally in a neutral position but depending on the situation they find it debatable whether cormorants should be controlled or not. Regarding the use of knowledge and data in management decisions, administrators have little confidence in non-scientific material, why this storyline *("individual observations and oral reports…")* has high importance for management. Generally administration agree with the use of mitigation measures and disagree with the storyline

saying cormorants are the reason for fishery closures. Solving the smolt conflict is seen as important.

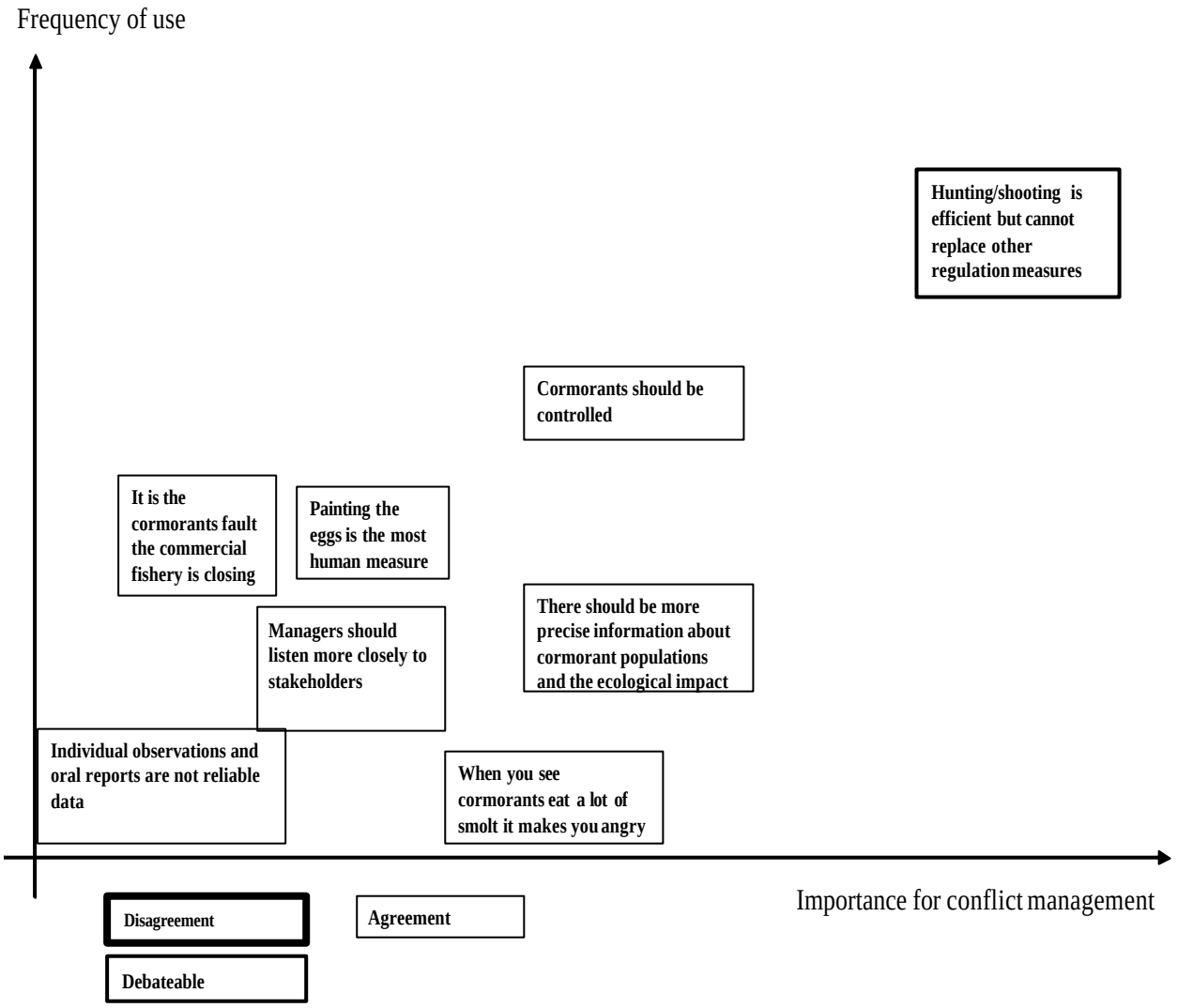


Commercial fishers include full and part time pound net fishers and the Danish Fishermen's Association. Overall commercial fishers agree with the storyline that cormorants should be controlled. Most pound net fishers claim that the cormorant is an important reason or even the one reason that pound net fisheries are closing. Another important storyline concerns the use of knowledge in management decisions *("Individual oberservations…").* The fishers generally experience not being heard and being respected for their knowledge on the resource. Commercial fishers agree with recreational fishers concerning problems related to cormorants eating smolt. Hunting is seen as an important and efficient mitigation measure.



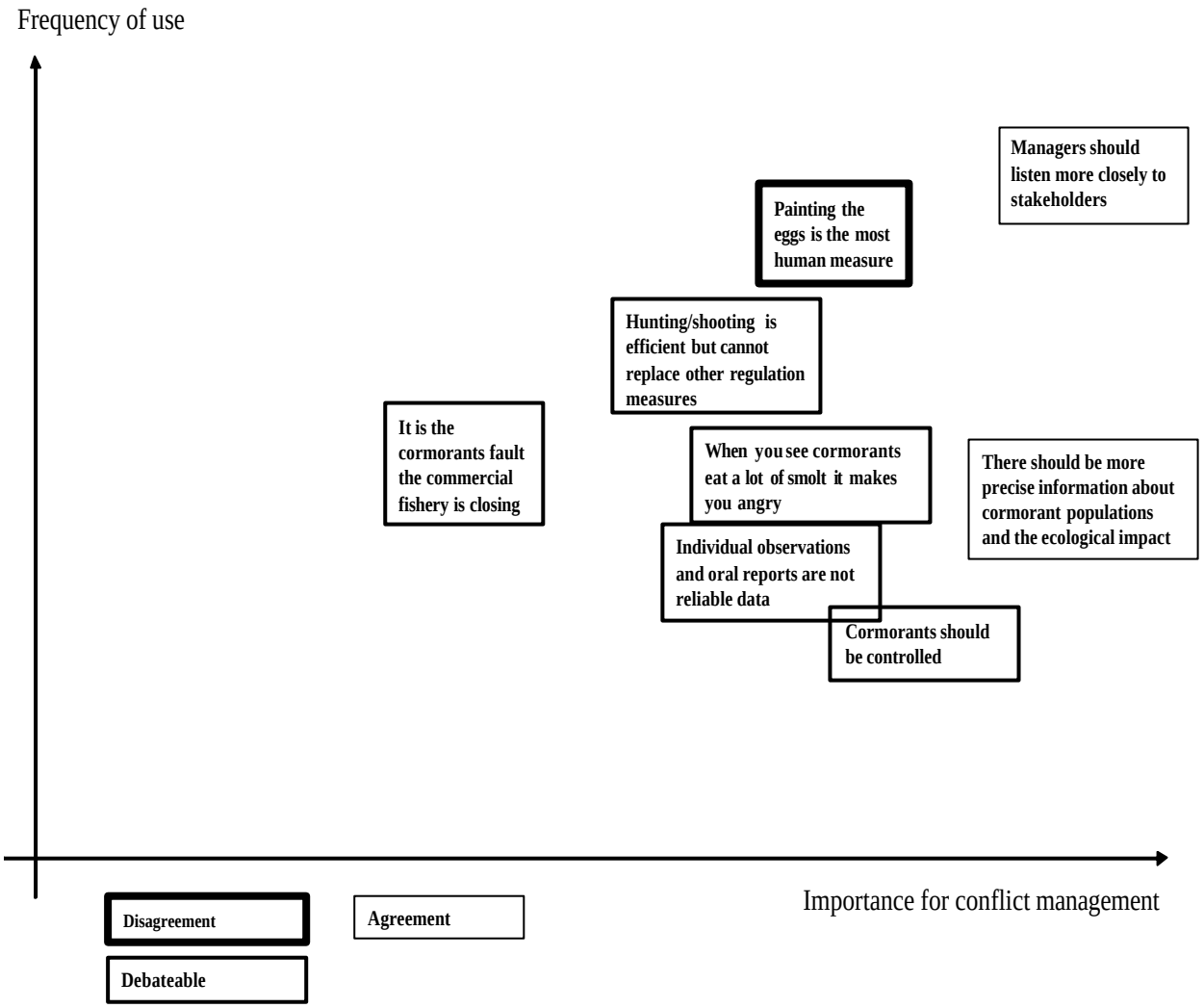
Conservationists include Danish Ornithologists Association and prominent environmentalists. This group of stakeholders generally disagree with cormorant populations being controlled. They see no clear connection between fishery closures and cormorants, but admit that there might be local conflicts which must be solved for the benefit of both fishers and birds. The general opposition to controlling cormorants also include a disagreement with the mitigation measures in use. Opposite of e.g. commercial fishers, the conservationist have less problems being heard by administration and managers and thus see it as less important to improve managers listening to stakeholders. Conservationists agree with the storyline that individual observations and oral reports (non-scientific) reports are not reliable.

National Hunters Association



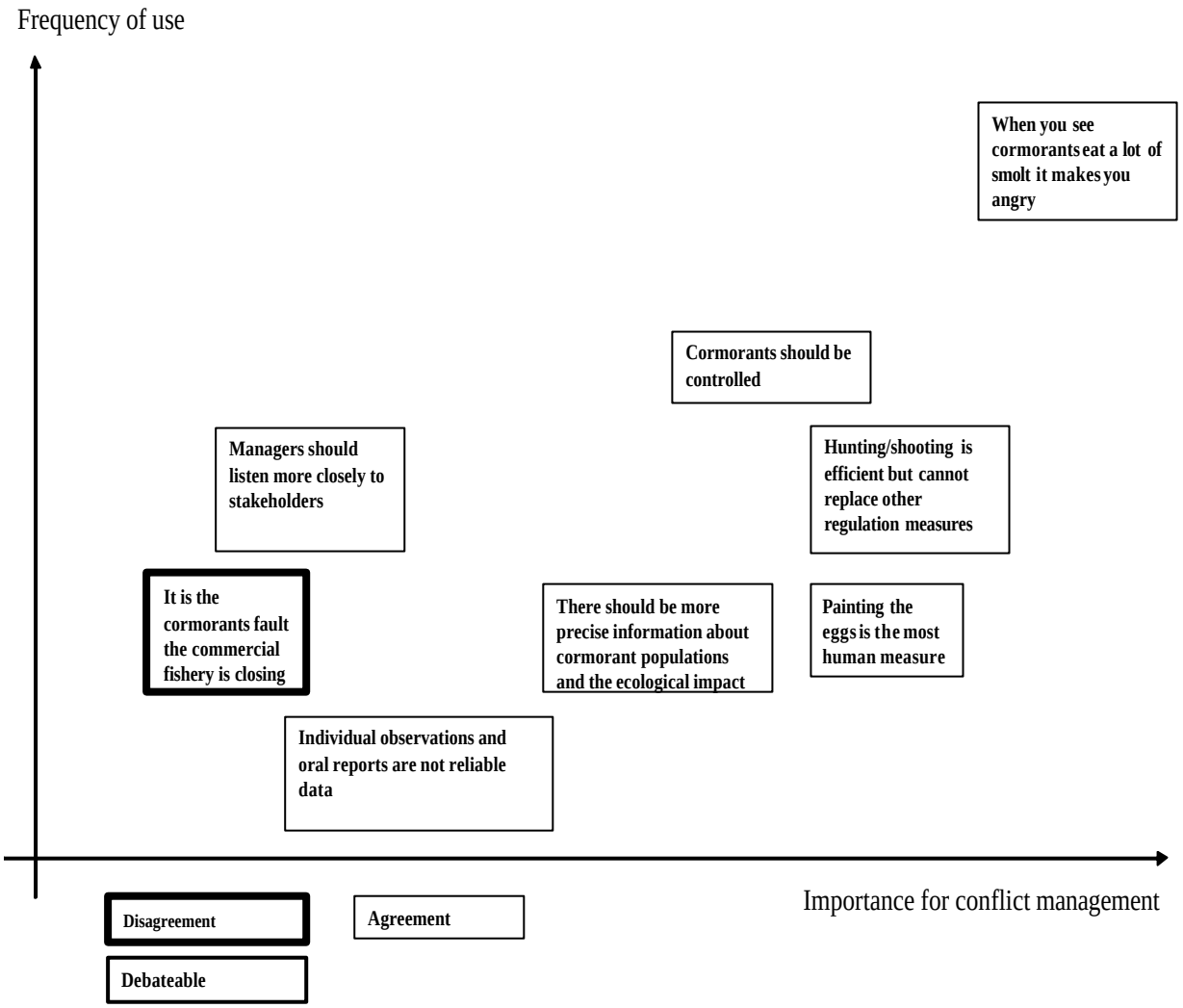
Hunters association question the use of hunting as a principal management measure. They are sceptical to the efficiency of shootings of cormorants unless this is done on a wider scale. Hunters generally agree with cormorants being controlled - especially with solving the existing local conflicts (fishers, recreational fishers etc.). Generally the Hunters Association see themselves as a potential assistant in solving local conflicts with cormorants, but they do not clearly express their position (indifferent) with how they value the cormorant management – this explains the relatively low level of importance with several of the storylines in the diagram.

National fisheries environmentalists

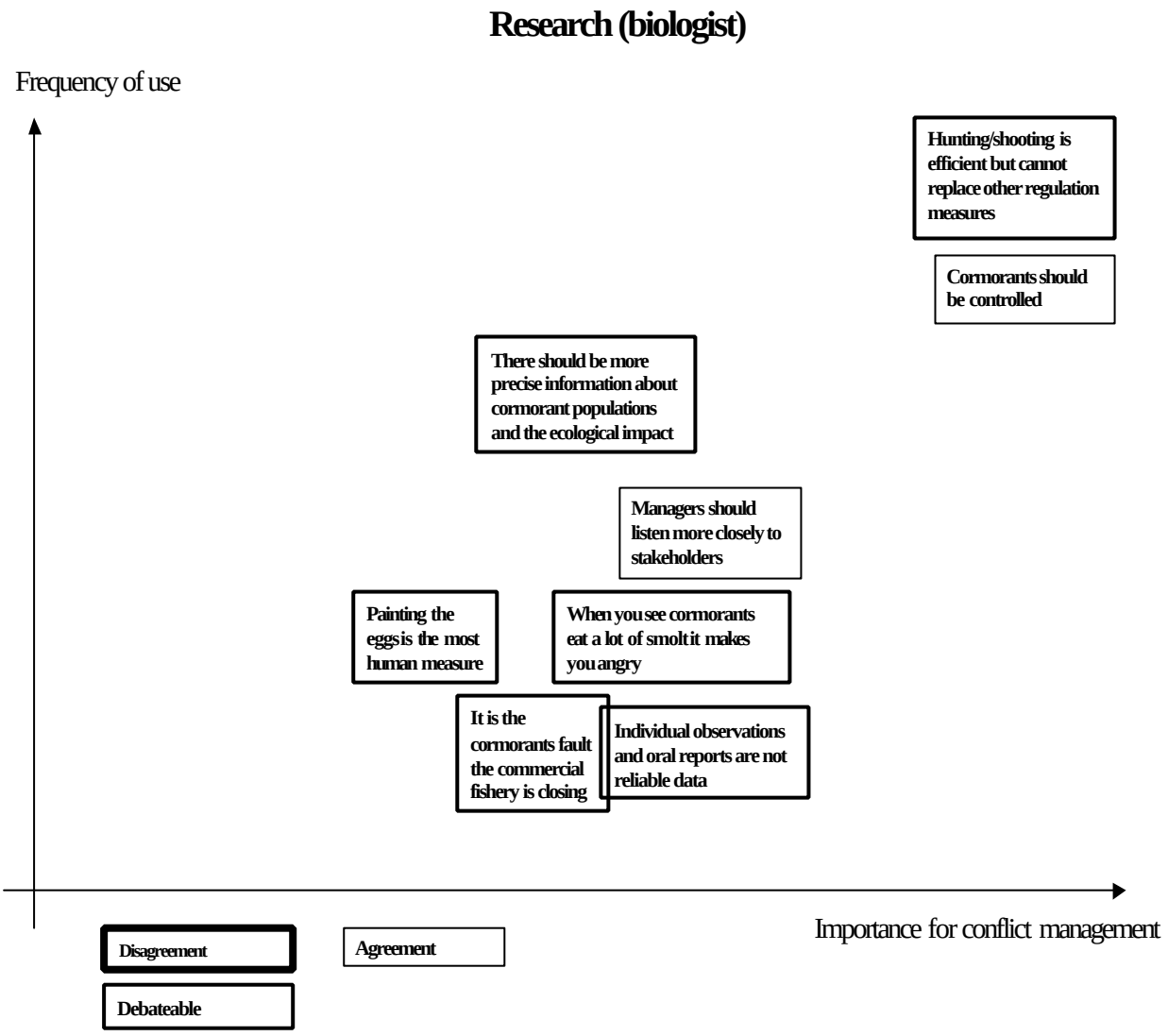


Overall the National Fisheries Environmentalist (NFE) disagree with painting of eggs as a preferable measure – they see it as too expensive and inefficient. The NFE agree with the storyline that managers should listen more closely to stakeholder and seek a profound understanding of what drives the resource users. The NFE agrees with the need to control cormorants as to benefit pound net fishers. On the other hand the NFE may find it debatable whether the cormorants are causing closures of commercial fisheries. Hunting is seen as useful measure albeit with limited efficiency.

Recreational fishers/anglers

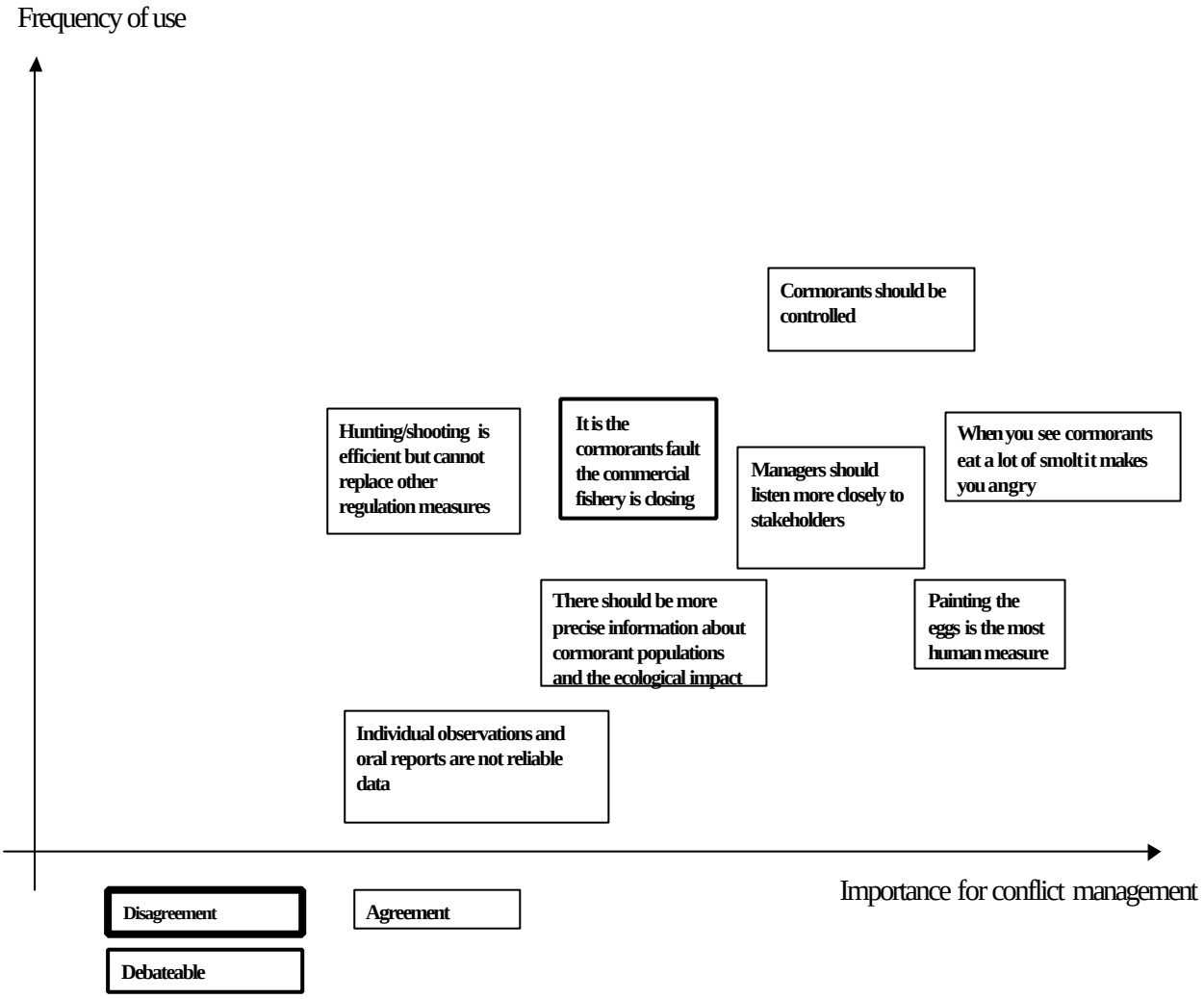


Recreational fishers and anglers include National Anglers Association, Danish Center for Wild Salmon, and people working with recreational fisheries. This group of stakeholders generally disagree with the storyline that it's the cormorant fault that commercial fisheries are closing. Solving the smolt conflict is seen as an important issue for management. These stakeholders basically agree with the typical measures (hunting/shooting and painting of eggs) taken to control cormorants and find these important for conflict management. There is agreement with the storyline that managers should listen to stakeholders, but it has minor importance in terms of conflict management – the group view it as less important that managers improve their listening to stakeholders.



Research includes biologists studying cormorants predation and reproduction. The stakeholder sees hunting as an important measure, albeit it is perceived as a limited tool. There is strong agreement with the storyline that cormorants must be controlled – (in order to improve the living conditions for the specie in general). The storyline concerning the reliability of individual reports is also seen with some importance, although the reliability is debateable. Research sees some connection between fishery closures and cormorants, but stress that this is a matter of local conflicts which can and must be solved for the benefit of both fishers and birds. The efficiency of painting the eggs is debatable.

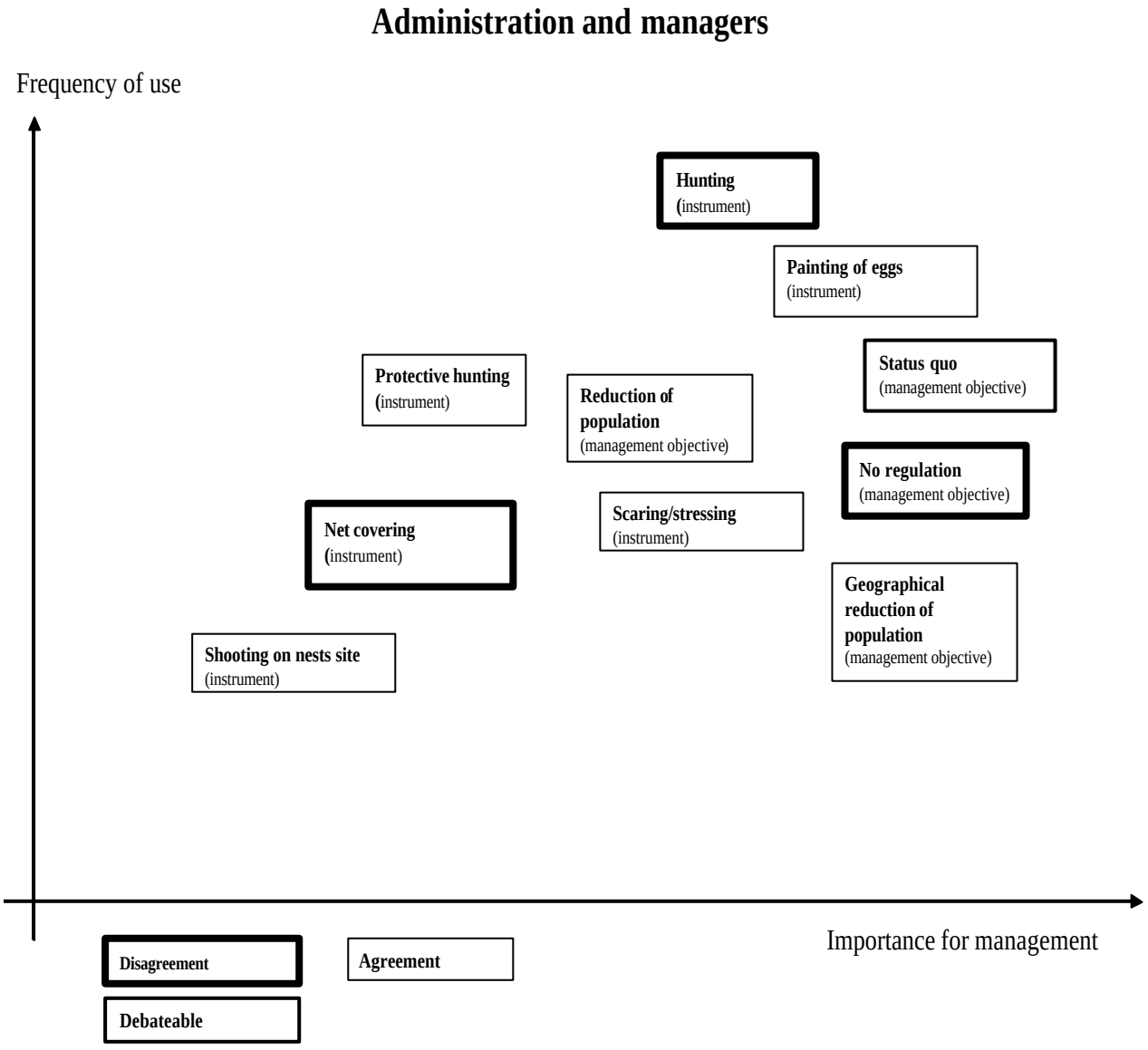
Tourism sector



The tourism sector includes interest groups promoting local tourism. They see the smolt conflict as important and that this must be solved in order to promote and preserve recreational fisheries/tourism. There is agreement with the measures taken to control cormorants. Painting of the eggs is seen as the most important to conflict management. The sector finds it debateable whether cormorants are actually causing closures of commercial fisheries. No doubt they see cormorants as a potential threat to commercial pound net fishers and hereby to the existence of a tourist attraction. Of less importance is the storyline concerning reliability of individual observations. There is agreement with the storyline that managers should listen closer to stakeholders and that cormorants should be controlled – both storylines are given high importance to conflict management.

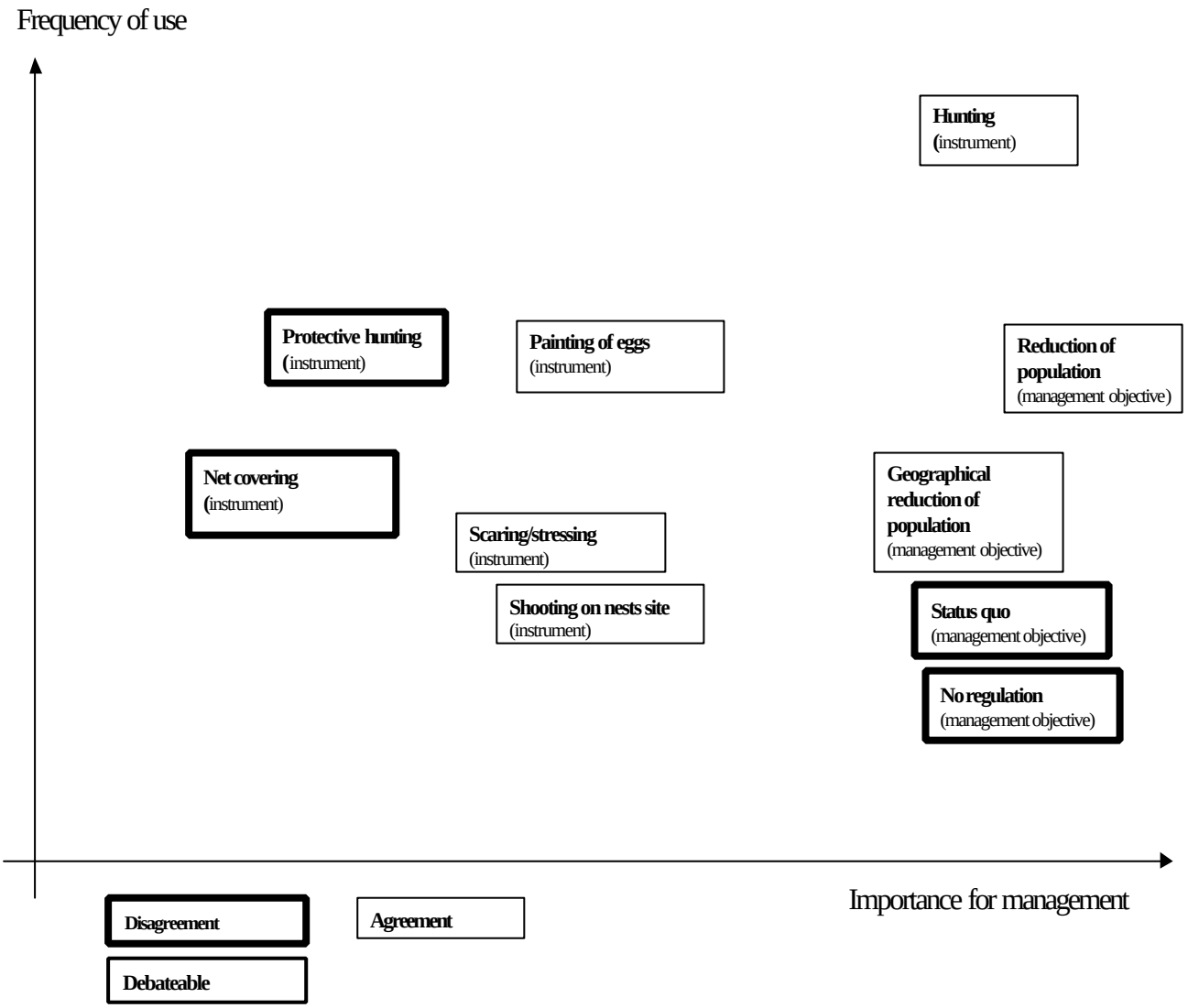
2.2.2 Variations of opinions among stakeholders by management options

The following graphs show the respective stakeholder group's opinions about management options.

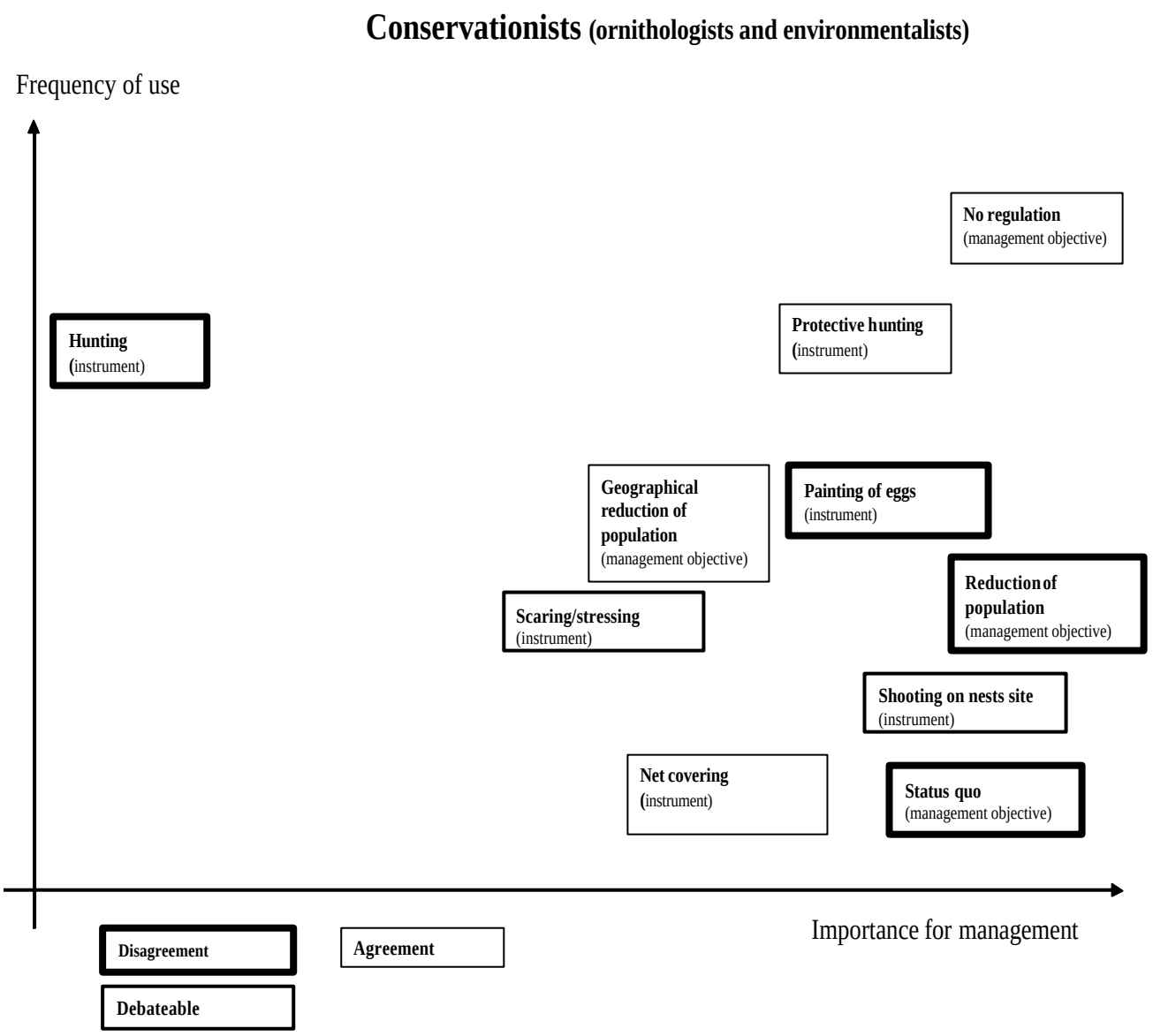


Administration and managers include public administration (county adm.), Forest and Nature Agency, State Forrest Districts. Overall administrators disagree with the management option *"no regulation"*. Also the option *"status quo"* - maintaining the present regulation effort - is debatable. There is agreement with most measures being taken and the management option of *"reducing the population"*. There is some disagreement with the efficiency of net coverings as a measure. The management option of "geographical reduction" is seen as important for management. Protective hunting is an often mentioned measure and there is agreement with this measure contrary to regular hunting which is contested.

Commercial fishers

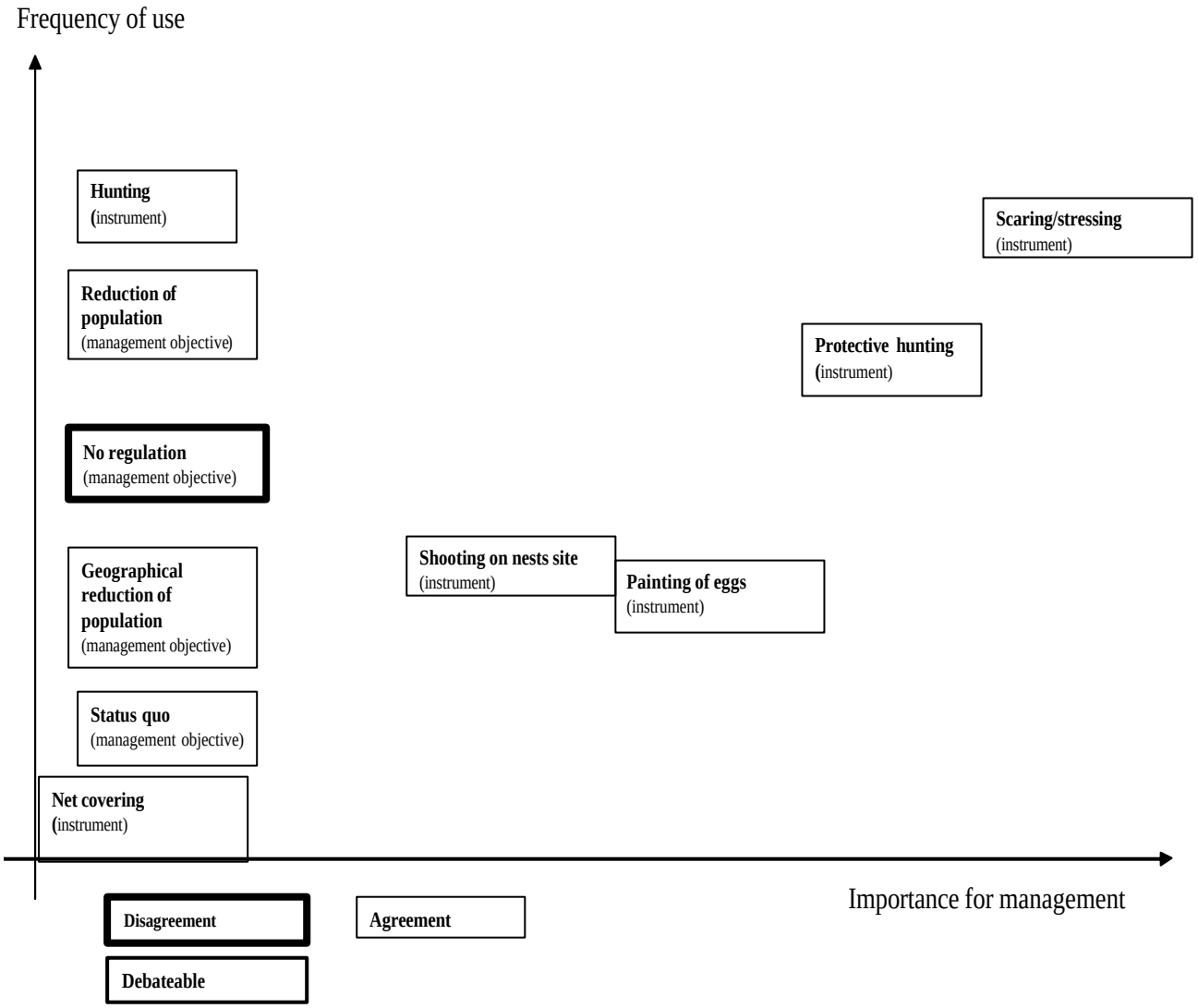


Commercial fishers include full and part time pound net fishers and the Danish Fishermen's Association. Overall commercial fishers disagree with the management options of "*status quo*" and "*no regulation*". The management options of general and geographical reduction of cormorants are seen as important to management. Fishers disagree with the efficiency of net coverings. There is agreement with shootings on nests sites, however hunting is mentioned more often as a potential measure and is seen as more important to management. A majority of fishers disagree with protective hunting as a effective instrument. Painting of eggs is less important, however still relevant - there is agreement with the measure.



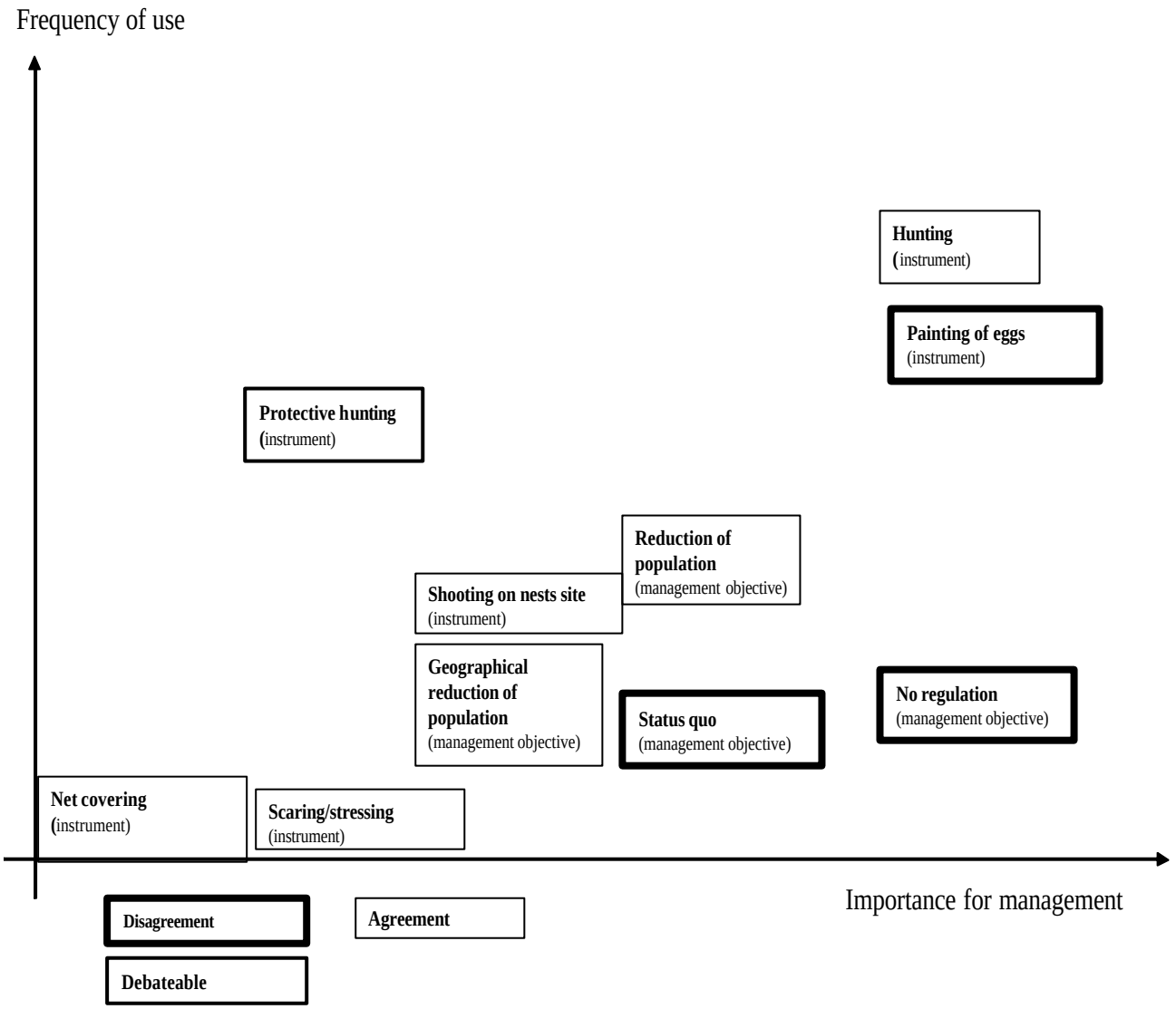
Conservationists include Danish Ornithologists Association and prominent environmentalists. This group of stakeholders generally disagree with the management options of *"population reduction"* or *"status quo"*. There is full agreement with the options of *"no regulation"* which is seen as very important to management. There is disagreement with the measure of *"painting of eggs"*. The agreement with other measures is debatable. Shooting on nest sites and net coverings are viewed as important to management. There is agreement with the management option of geographical reduction. Hunting is very contested whereas protective hunting is agreed upon.

Hunters National Association



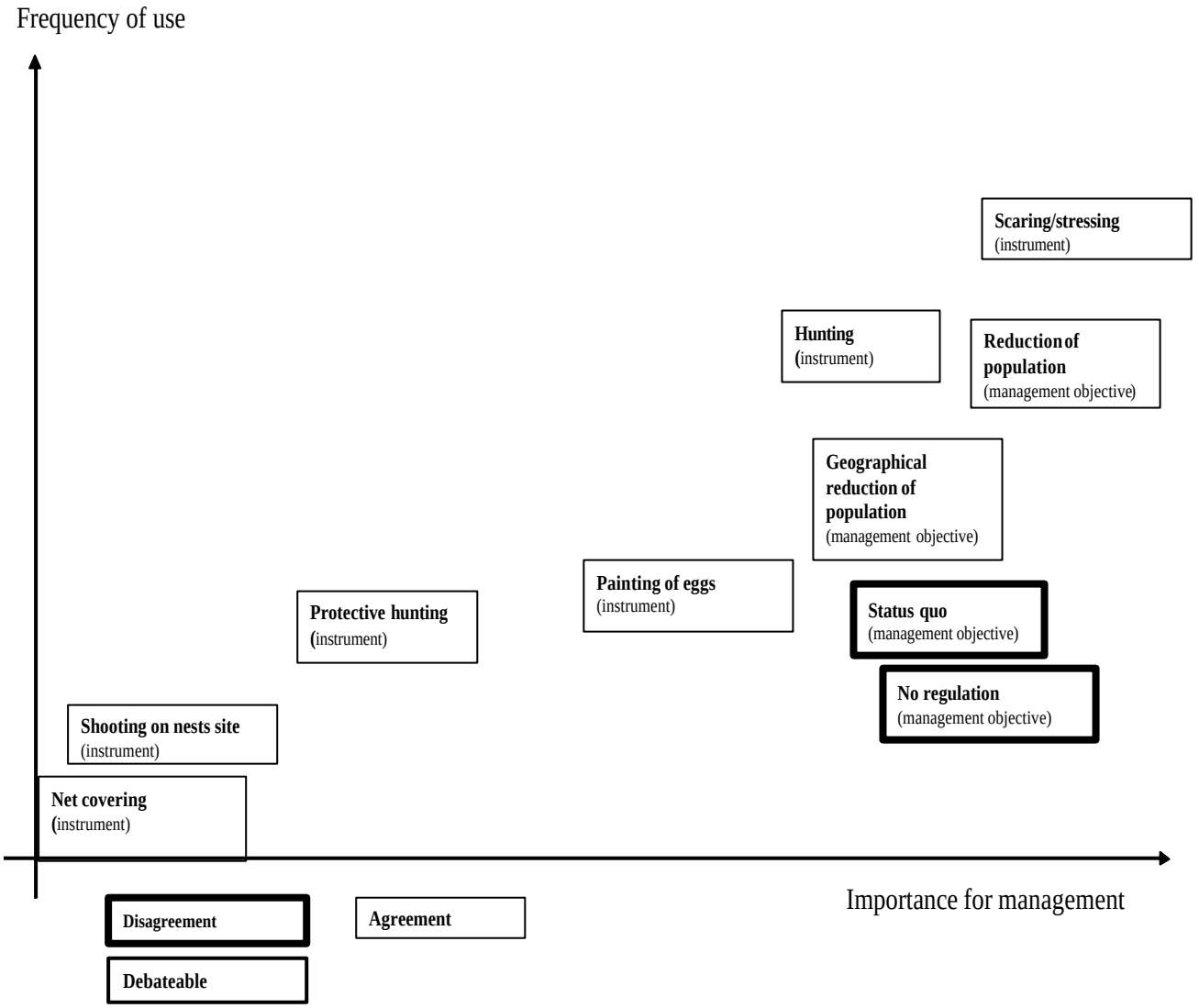
The Hunters National Association (HNA) do not disagree with any management options except a general hunting season. The HNA has no economic interest in cormorants or cormorants management and is thus relatively indifferent to most questions. However, protective hunting and shooting is spoken of and seen as important measures to management. There is agreement with the management option to reduce the population and the Association is willing to assist with protective hunting if they are called upon by managers. However, HNA are against a general hunting season because they do not perceive the cormorant as a game species.

National fisheries environmentalist



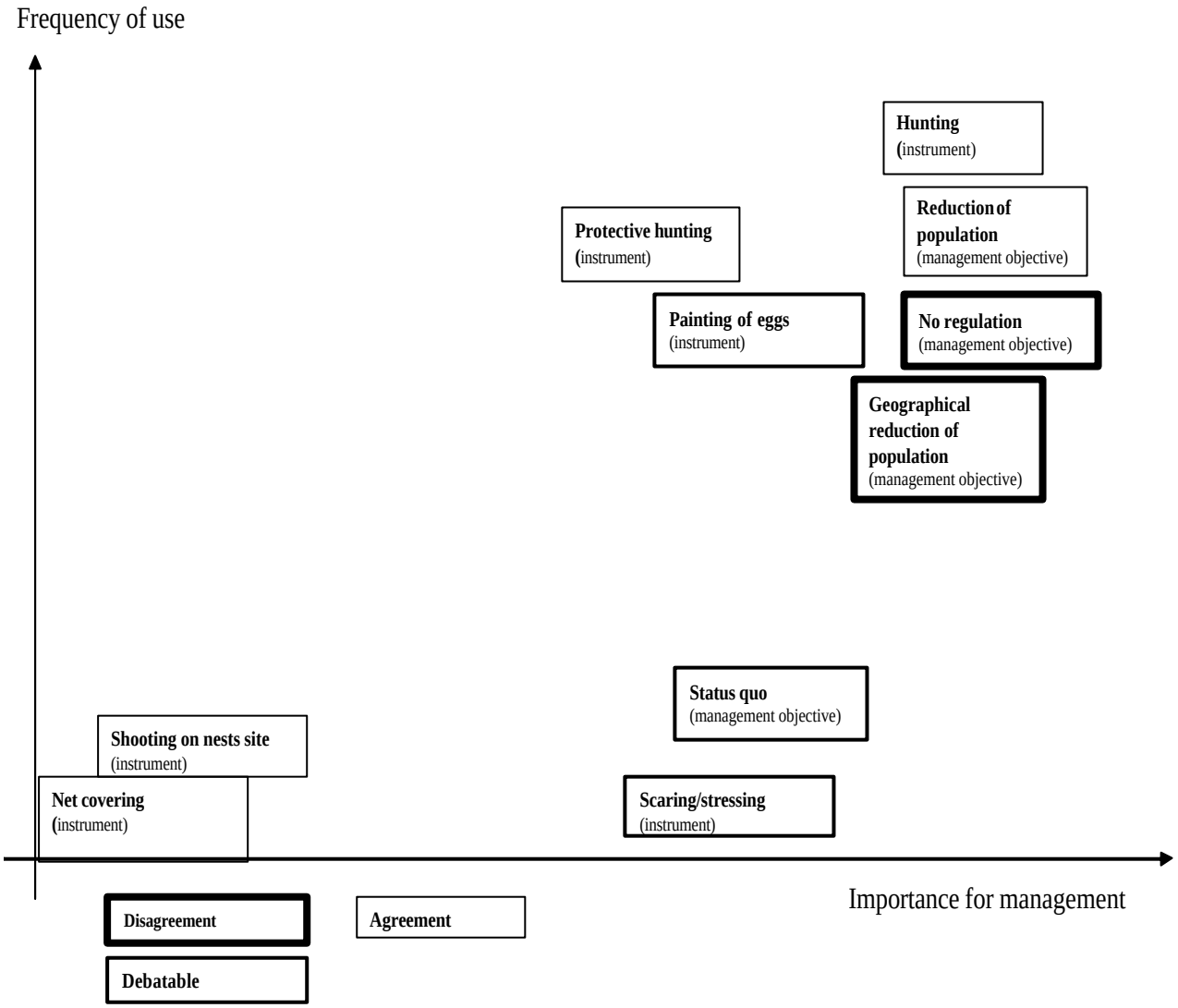
The National Fisheries Environmentalist (NFE) disagree with painting of eggs as a preferable measure – they see it as too expensive and inefficient. Very importantly the NFE disagree with the management options *"no regulation"* and *"status quo"*. The NFE agree with options of reducing the population in general as well as geographically. General Hunting is mentioned as a measure which should be taken. There is agreement with the measures of net coverings and scaring of cormorants, however these measures are not seen as important to management. Protective hunting is perceived as inefficient but an instrument with a potential.

Recreational fishers/anglers



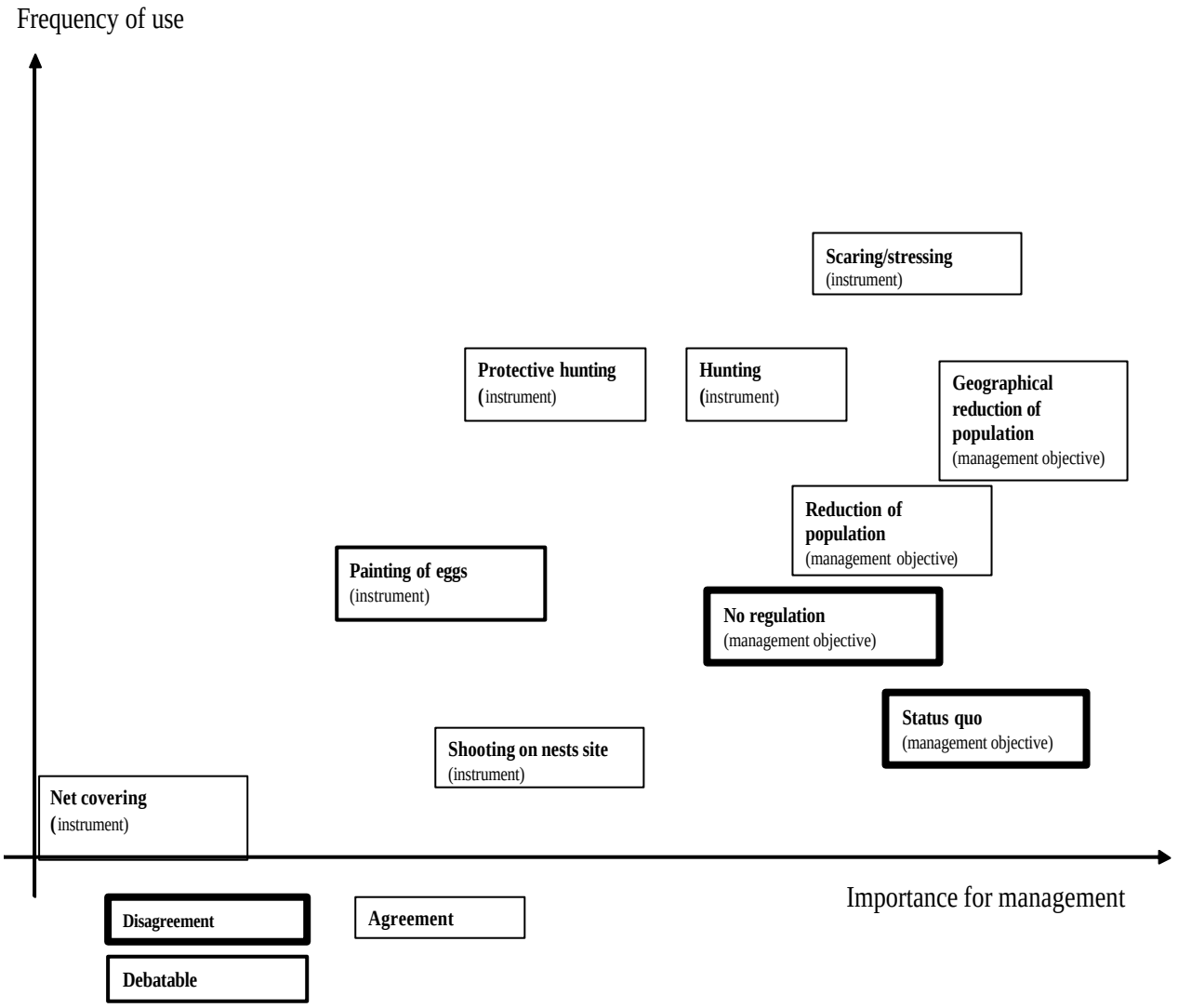
Recreational fishers and anglers include National Anglers Association, Danish Center for Wild Salmon, and individuals working with recreational fisheries. This group of stakeholders generally disagree with the management options "status quo" or "no regulation". There is agreement with a general and geographical reduction of the population. Scaring and stressing of cormorants, hunting and painting of eggs are seen as important measures, while other measures are seldom spoken of.

Research (biologist)



Research includes biologists studying cormorants predation and reproduction. This stakeholder generally disagrees with the management options of *"no regulation"* and *"geographical regulation"*. The option of *"status quo"* is debatable, while there is agreement with "reduction of the population". There is agreement with a general hunting season and it is seen as important to management. The agreement with *"painting of eggs"* is debatable, however it is seen as an important issue in management. The measures of net coverings and shootings on nest sites are perceived as less important.

Tourism sector

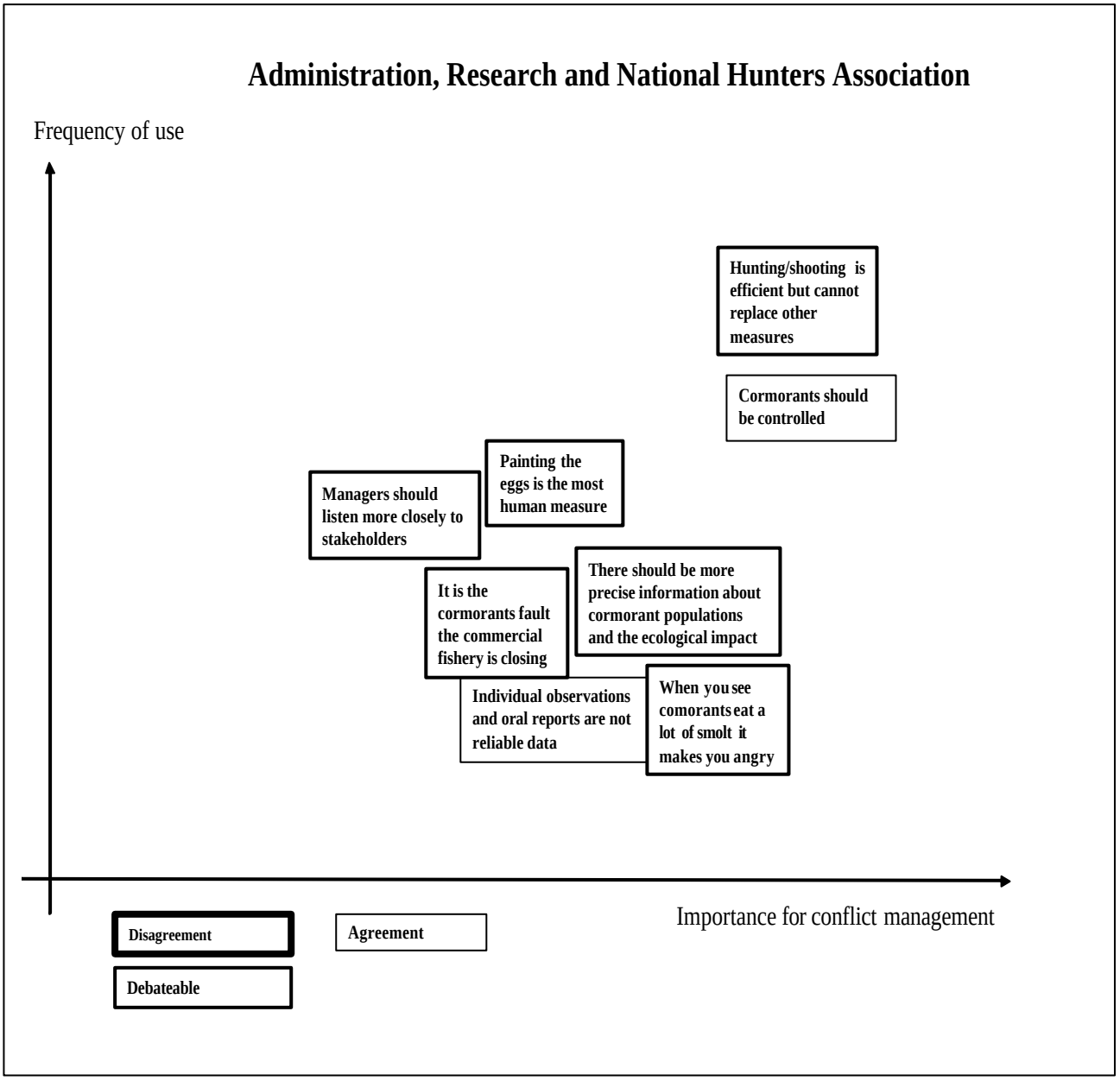


The tourism sector includes interest groups promoting local conventional tourism. The sector show disagreement with the management measures *"no regulation"* and *"status quo"*. There is agreement with a general and geographical population reduction. The support for *"painting of eggs"* is debatable while there is agreement with other measures. Net coverings are seen as less important. A general hunting season is perceived as positive.

2.3 Aggregations of opinions

2.3.1 Aggregations of opinions regarding story lines

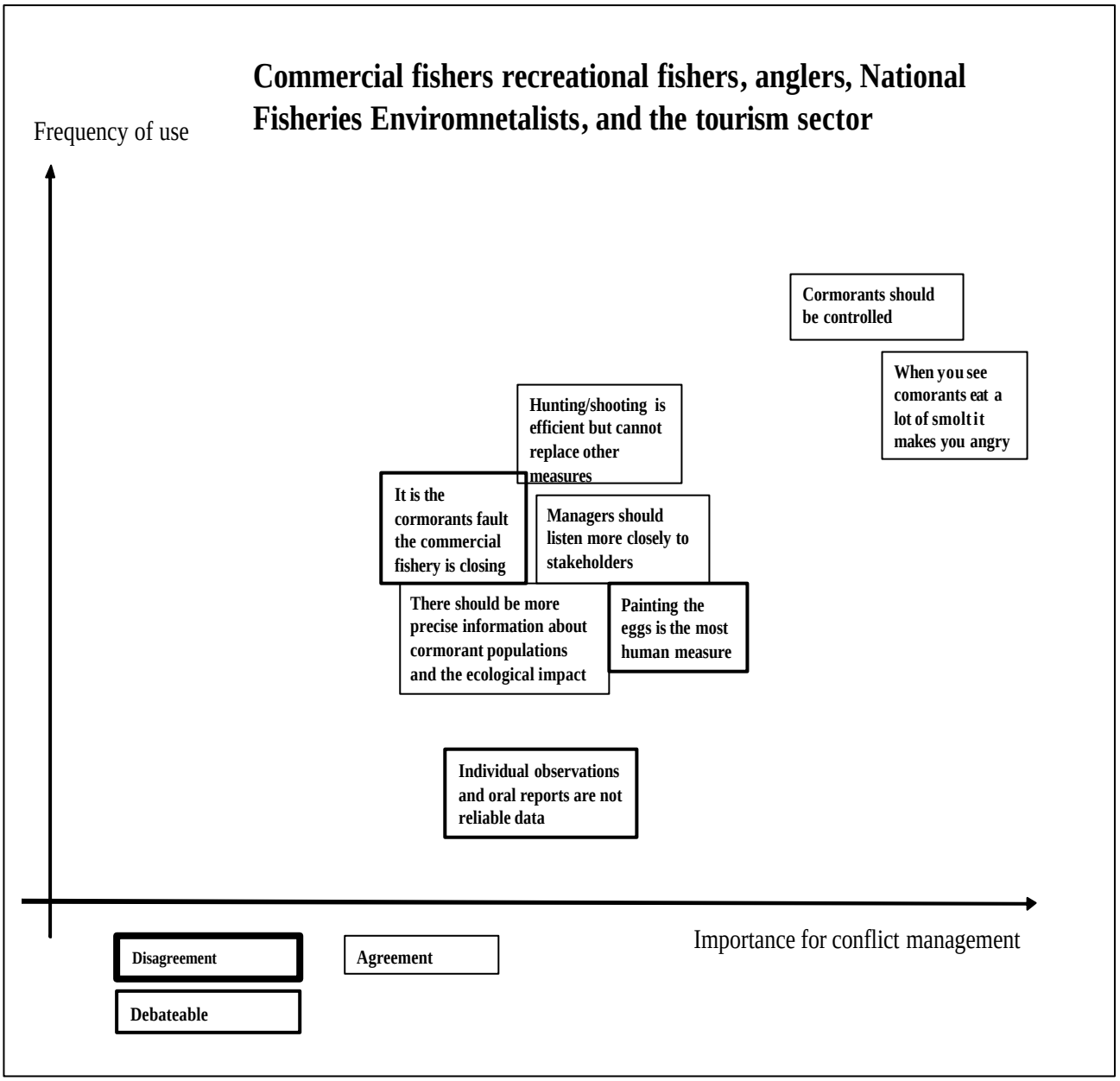
Storylines - preference structure for the *group of stakeholders* attempting neutrality as a result of their position.



Administration, Research and National Hunters Association, include stakeholders who generally attempt neutrality as a result of their position. The neutrality is expressed in the graph where most storylines are placed in the centre in terms of importance to management and frequency with which it's mentioned. Also there are no specific disagreements and few agreements. The storyline *"hunting is efficient but cannot replace other regulation measures"*, is debatable but there is consensus concerning its importance to management.

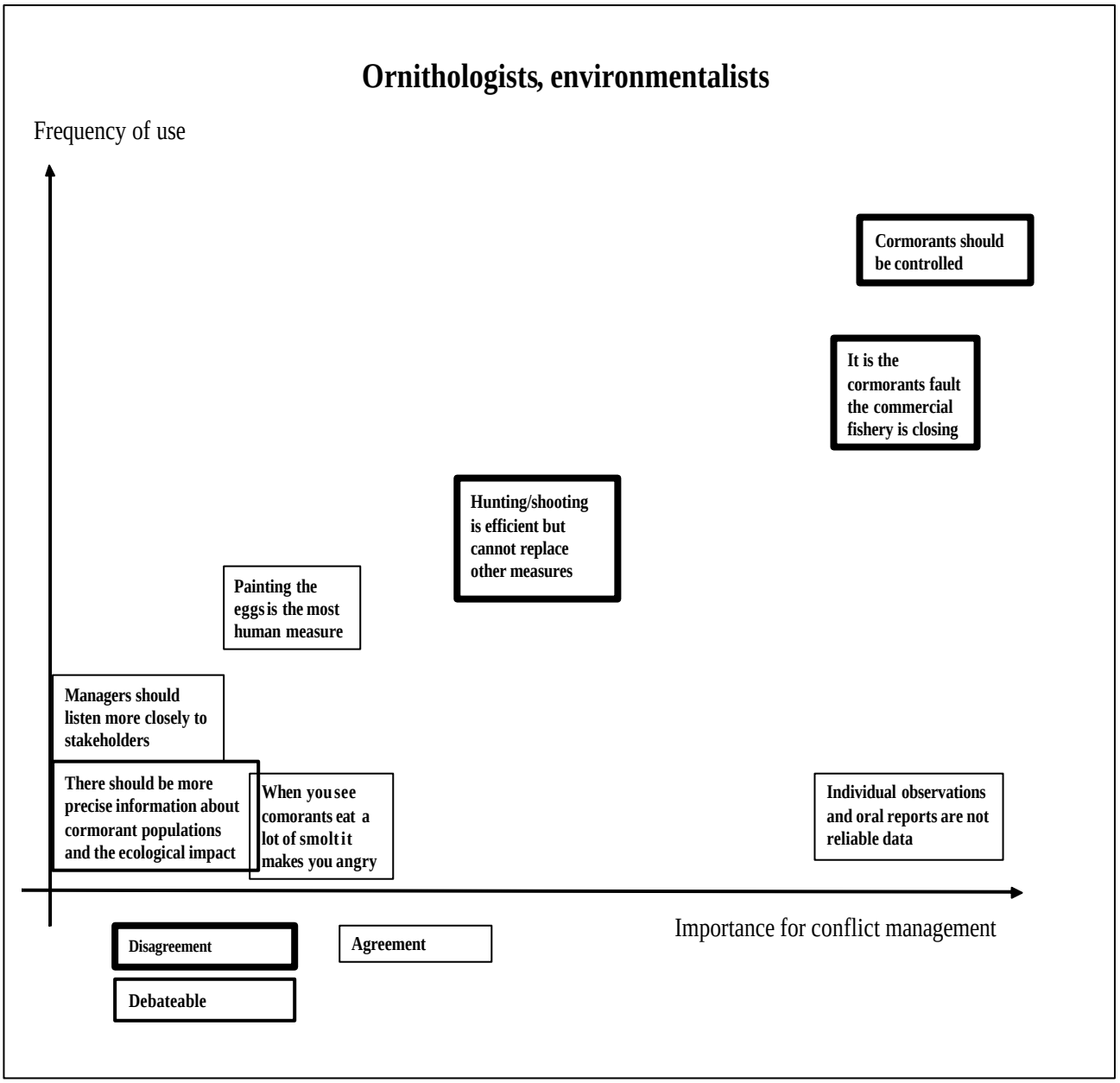
There is an overall agreement that cormorants should be controlled and that this is important to conflict management.

Storylines -preference structure for the *group of stakeholders* who argue for a different and/or more strict regulation of cormorants.



This group of stakeholders include commercial pound net fishers, recreational fisheries, National Anglers Association, the tourism sector and national fisheries environmentalists. The aggregated preference structure place most storylines in the centre – medium importance. The storyline saying "*it's the cormorants fault that fisheries are closing"*, is debatable and so is the storyline saying that individual observations and oral reports are not reliable. There is agreement with the two storylines saying that *cormorants should be controlled* and that *the smolt conflict is disturbing*. These storylines are seen as important.

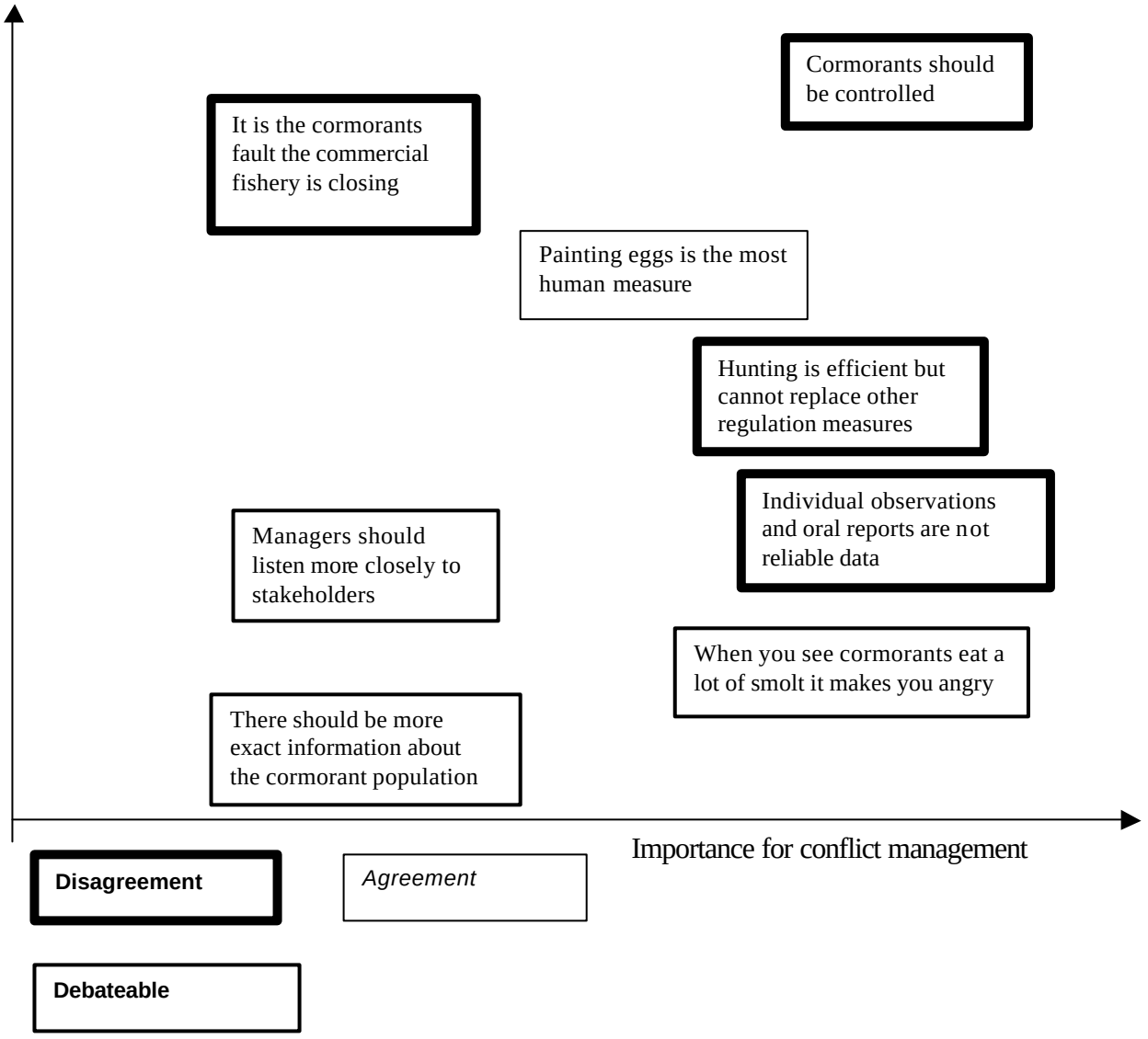
Storylines - preference structure for the *group of stakeholders* who are positive towards cormorants and argue against regulation of cormorants.



Conservationists include Danish Ornithologists Association and prominent environmentalists. This group of stakeholders generally disagree with cormorant populations being controlled. They see no clear connection between fishery closures and cormorants, but admit that there might be local conflicts which must be solved for the benefit of both fishers and birds. The general opposition to controlling cormorants is also shown in the disagreement with the mitigation measures in use. Opposite of e.g. commercial fishers the conservationists have less problems being heard by administration and managers and thus see it as less important to improve managers listening. Conservationists agree with the storyline "*individual observations and oral reports (non-scientific) reports are not reliable"*.

Aggregation of opinions of all stakeholders by storylines

Frequency of use



Of the storylines identified in the interviews, the issue of whether the population of cormorants should be controlled is the one causing the fundamental disagreement. The core of the disagreement on the storyline "*hunting is efficient but cannot replace other regulation measures*" is the issue of whether a reintroduction of a general hunting season will have any effect on the conflict. Currently this is not an option but arguments in favour of hunting play an important role in the discourse of managing the conflict. Despite the disagreement on whether hunting is favourable or not as an instrument there is consensus among most stakeholders that a hunting season is not a solution to the conflict. Relatively few stakeholders raise the issue of cormorants causing problems for juvenile salmon and trout. There is disagreement about whether this is a problem or not but most stakeholders see this type of conflict as the most important driver of other conflicts in the future. This is also related to why the storyline "*It is the cormorants fault the commercial fishery is closing*" is considered

as having only a medium importance for conflict management as compared to the smolt conflict. There is still strong disagreement to what degree cormorants constitute a problem for pound net fishers.

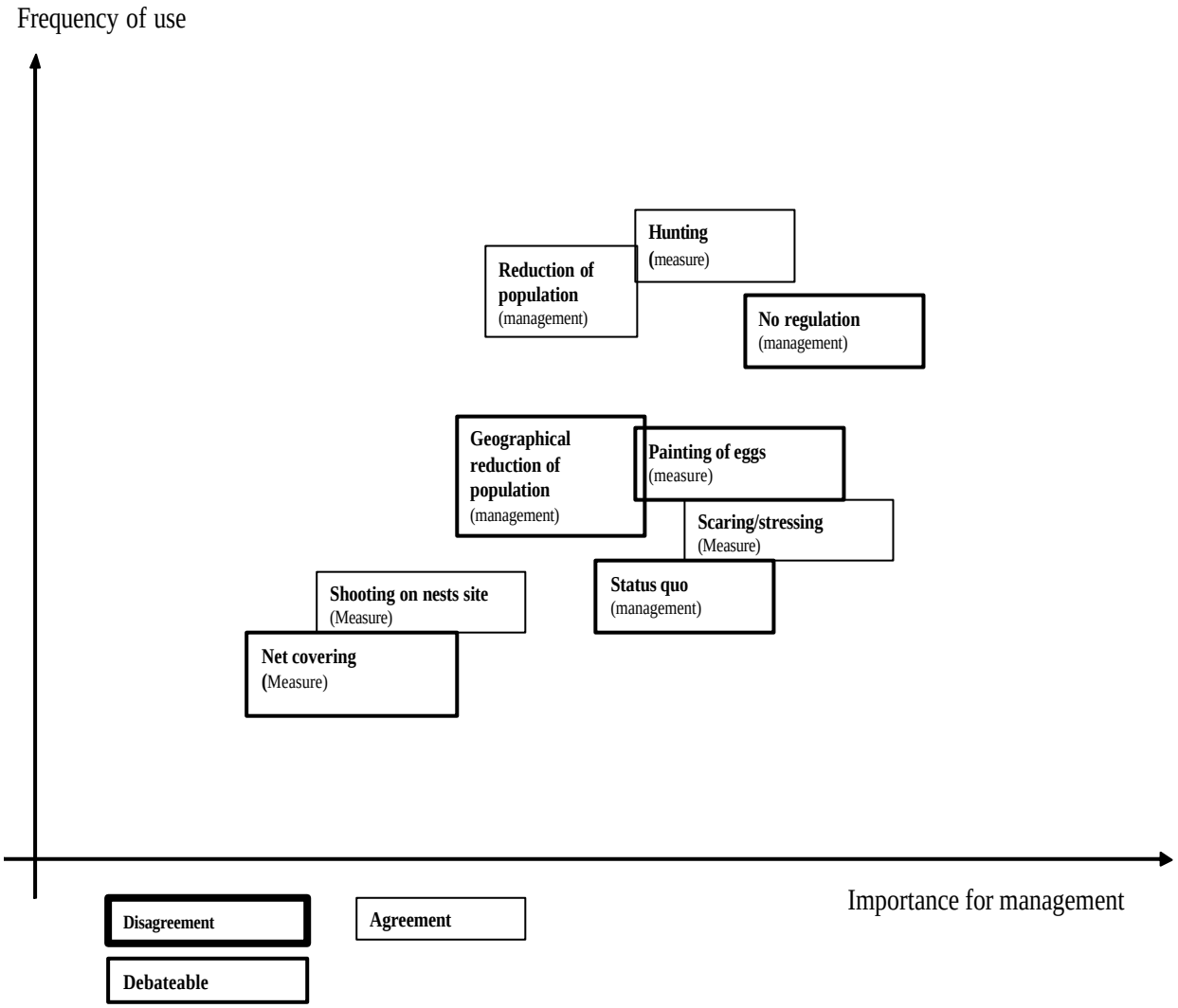
The disagreement on the degree to which cormorants are causing problems for the pound net fishery as well as to the ecosystem is very much related to the story line "*individual observations and oral reports are not reliable data"*. Fishers claim that their problems are easy observable whereas administrators and environmental stakeholders claim that problems have not been sufficiently scientifically documented. This storyline has clear threads to questions of how knowledge is produced and used in management and the implications this has for legitimacy of management. This is also very much related to the storyline "*Managers should listen more closely to stakeholders"* which is raised by relatively few stakeholders. There is some consensus among stakeholders that the situation has improved since the first management plan but the issue about managers listening is linked to the two storylines described above.

The placement of the storyline "*Painting eggs is the most human measure"* (culling by oiling) shows that oiling eggs is not considered by any stakeholder to be highly controversial. From an animal welfare perspective a majority of stakeholders regard this as an ethically correct instrument. The storyline of "*There should be more exact information about the cormorant population"* is raised by few of stakeholders but point towards that a lack of knowledge on certain areas create uncertainties and myths. This is important for conflict management because the uncertainty in also driving the conflicts.

2.3.2 Aggregations of opinions regarding management options

Management options - preference structure for the *group of stakeholders* who attempt neutrality as a result of their position.

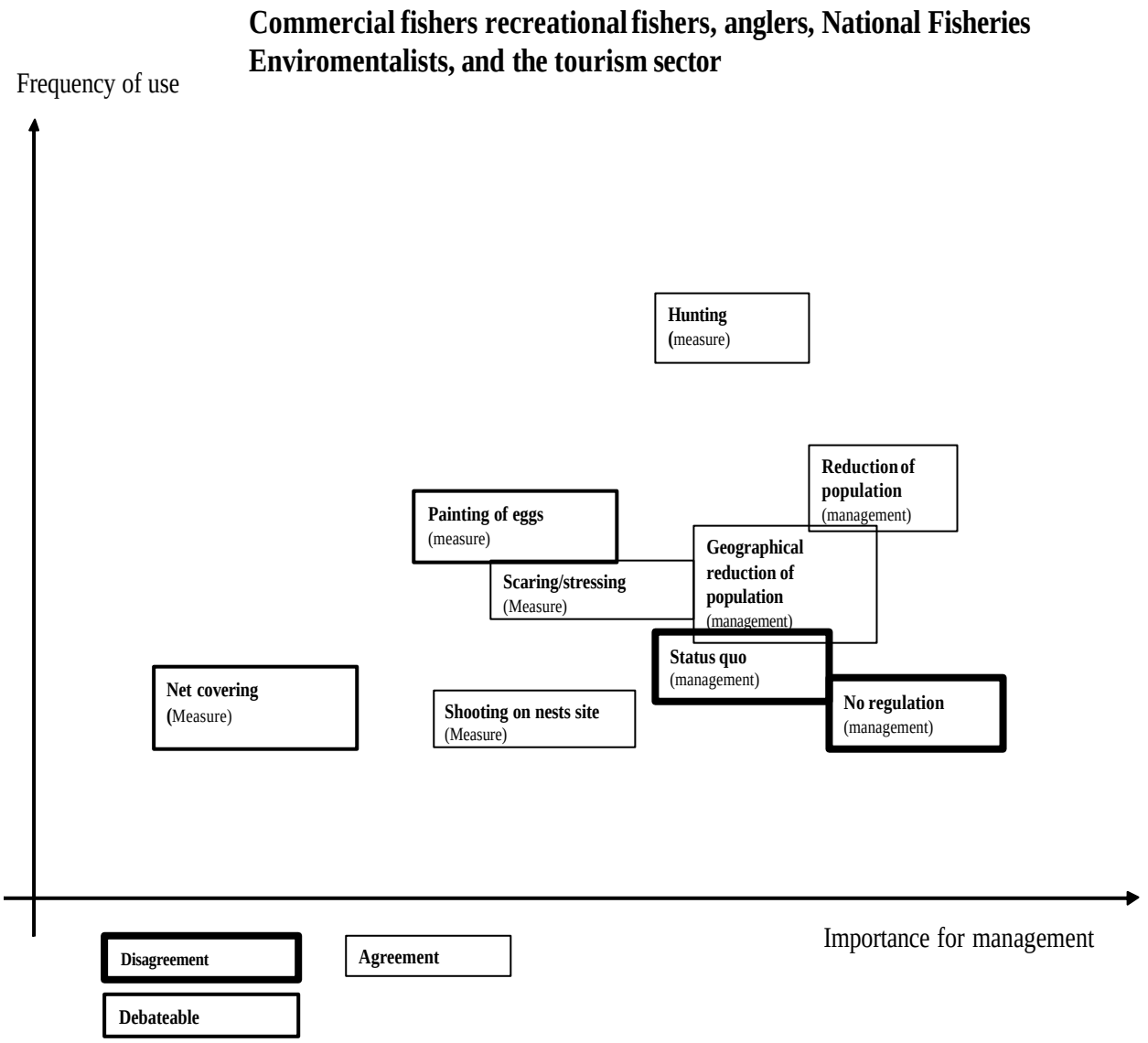
Administration, Research, National Hunters Association.



Administration, Research and National Hunters Association, include stakeholders who generally attempt neutrality as a result of their position. The neutrality is expressed in the diagram: Management options and management measures are generally in the centre of the diagram in terms of importance to management and the frequency with which it is mentioned. The majority of the management options (although conflicting) are debatable in terms of agreement. This is also due to a relative indifference of the National Hunters Association and a more proactive position among administration. The question of whether there should be regulation or not is seen as important to management. Painting of eggs and hunting are seen as the most important measures along with scaring/stressing of cormorants – there is agreement about the latter measure. Net coverings are valued as less important to

management. Shooting on nest sites is also low on the scale of importance although it is a well used measure.

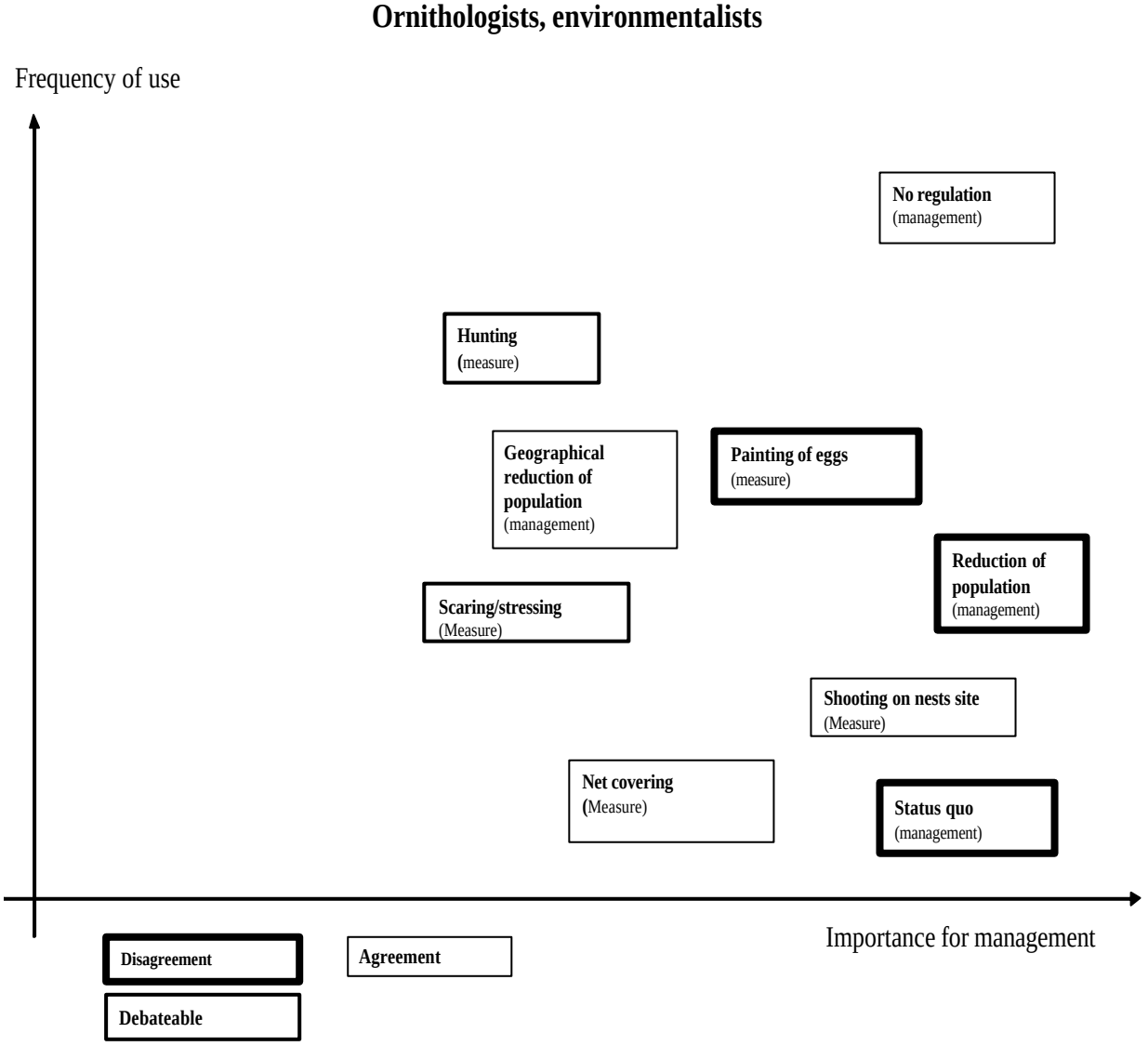
Management options - preference structure for the *group of stakeholders* who argue for a different and/or more strict regulation of cormorants.



This group of stakeholders include commercial pound net fishers, recreational fisheries, National Anglers Association, the tourism sector and National Fisheries Environmentalists. The group disagree with the management option of "*no regulation*" or even a "*status quo*" of the present regulation – these issues are seen as important to management. Overall there is agreement with the management options of reducing the population. There is overall agreement about using shooting on nest sites and hunting as management measures – the latter is seen as most important. The agreement about the measures "*painting of eggs*" and "*net coverings*" are debatable – the former is most important to management. There is

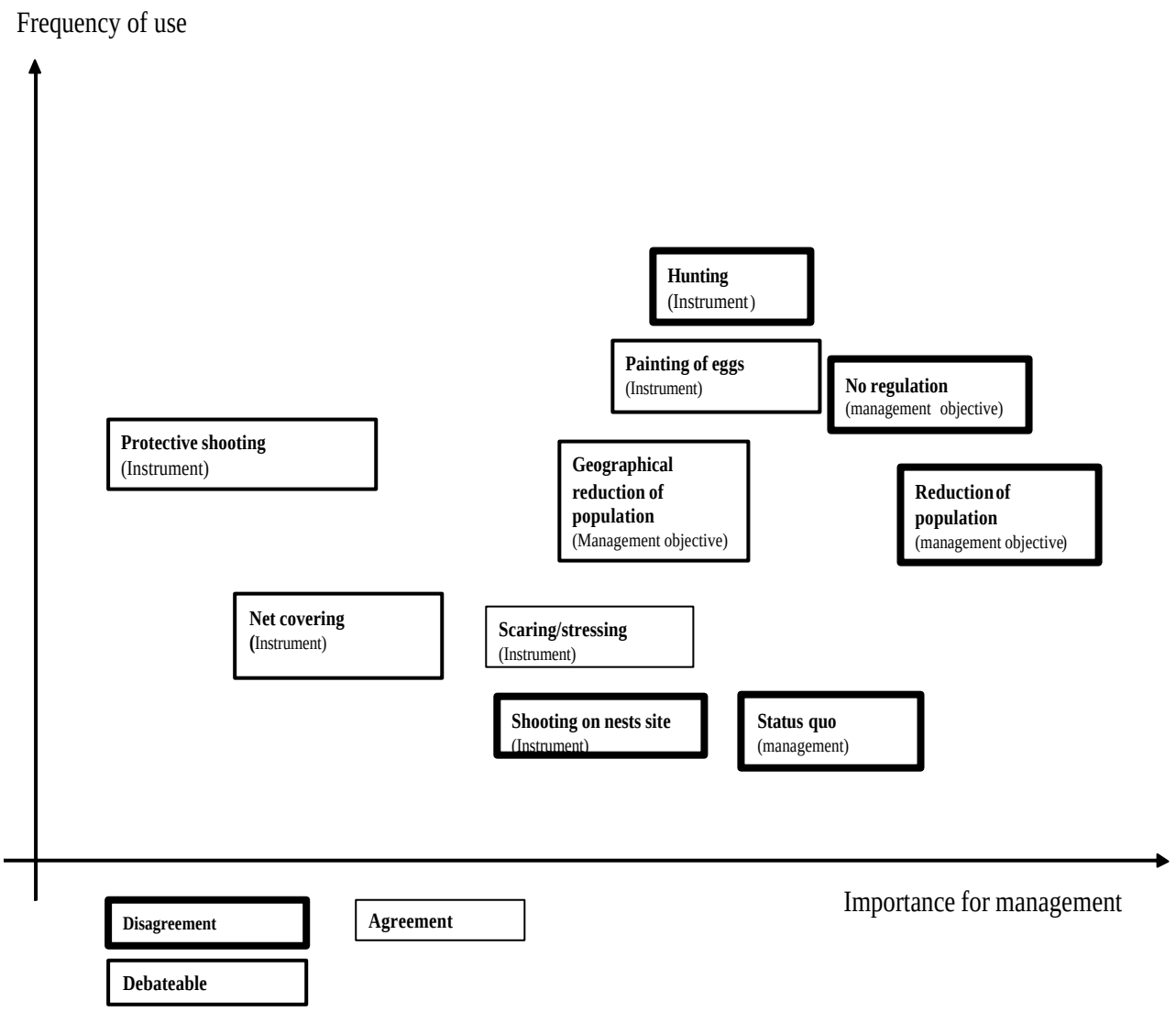
agreement about using scaring/stressing as a measure – it is seen as relatively important to management.

Management options - preference structure for the *group of stakeholders* who are positive towards cormorants and argue against management of cormorants.



The group include Danish Ornithologists Association and prominent environmentalists. This group of stakeholders generally disagree with the management options of "*population reduction*" and "*status quo*". There is full agreement with the options of "*no regulation*" which is seen as very important to management. There is disagreement with the measure of "*painting of eggs*". The agreement with other measures is debatable. Shooting on nest sites and net coverings are viewed as relatively important to management. There is agreement with the management option of geographical reduction – this option is placed medium on the scale of importance to management.

Aggregation of all stakeholders opinions on management options.



Of the four management objectives emerging from the interviews it is clear that three of them are considered to be important for conflict management by different stakeholders but each of the objectives are also contested by other stakeholders. The management objective "*no regulation"* is a preference for environmentalist and ornithologists and to some degree also for managers, According to this group of stakeholders the alleged problems have not been documented to a degree that justifies population control. Although not contributing to conflict management it is a basic preference influencing the attitudes of this group of stakeholder regarding management.

The management objective of "*Reduction of population"* is a preference to the group of stakeholders composed by commercial fishers, recreational fishers and their respective organisations. A population reduction is seen as a solution to the conflict albeit this is highly contested by other stakeholders. The "*Status quo"* objective is put forward by managers. The

objective *"geographical reduction of population"* is supported by the two opposing stakeholder groups representing environmental goals and fishing interests but is in reality composed by two distinct objectives. Those representing environmental interests believe that management of cormorants should be site specific and not national uniform large-scale measures. Fishery stakeholders on the other hand are of the opinion that a zoning system allowing cormorant colonies can only in certain geographical areas could be an improvement. The different understandings of the problem become evident here because fishery stakeholders claim that problems can not be solved locally whereas environmental interests object to management measures that impact the population on a national level as a zoning system would. From an environmental interest perspective the *"geographical reduction of population"* is rather important for conflict management whereas it is not as important for the fishery interests.

Of the different instruments mentioned by stakeholders the two most contested instruments are *hunting* and *shooting on nest sites*. Both the instruments are not in use currently but was widely used before 1980. The term hunting includes a reintroduction of a general hunting season. The stakeholders in favour of these instruments are typically those with fishery interests. The desire to reintroduce a general hunting season is a very frequently used argument and is based on the belief that hunting will reduce the population. The instrument is the most contested of all and also by the national hunting association and even some stakeholders with fishery interests. The reason for this is a widespread disbelief in the effect of a hunting season. This lack of effect is explained by an expected low interest from hunters in the cormorant as a game specie and the general perception that cormorants are difficult to hunt. Even among those advocating for a general hunting season the effect is questioned. A general hunting season is currently not an option within the EU legislation.

The instrument of *"shooting on nest sites"* is primarily put forward by stakeholders with fisheries interests seeking a general reduction of the population and not just a reduction of the breeding. The opposition to this instrument is primarily that it is not ethically acceptable from an animal welfare perspective. However, several stakeholders believe it would be the most effective instrument if the population must be reduced rapidly.

Overall the instrument of *"scaring/stressing"* is the on that most can agree upon when used for mitigating the conflict of cormorant predation on salmon and trout juveniles. The downside of this instrument is that as other bird species are affected as well.

Considering *oiling* of eggs, the motives differ and the perceptions range from seeing it as an unnecessary but harmless instrument to the perception that the instrument is very important resolving conflicts. Environmental stakeholders are divided on this instrument both on the effect of oiling eggs as well as whether this instrument is ethically the most feasible. Administrators are divided as well. The viewpoints range from oiling being a waste of money to oiling being an effective instrument to reduce the population. Among fishery interests the use of the instrument is seen as an improvement of the management and an effective way to reduce the population but not an immediate solution to existing conflicts.

The instrument of *"protective shooting/hunting"* within 1000m of fixed fishing gears is regarded by a majority of stakeholders as an instrument with an effect that is psychological. The majority of fishers believe that the instrument has very little effect on the predation level as very few cormorants are shot. Other stakeholders see the instrument as a valve allowing the fishers to abreact. Overall the instrument is regarded as insignificant in terms of managing the

conflict. However, one fisher who claims that when organised in the right way the instrument is very effective in managing the conflict contradicts this.

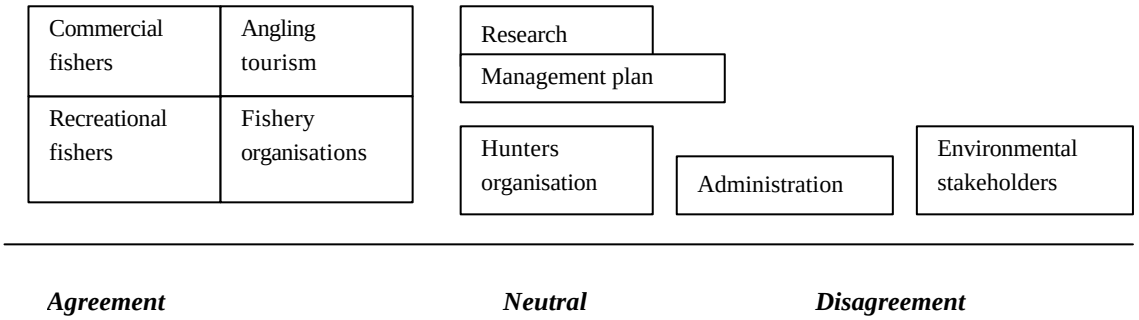
There is a sort of consensus on the "*net coverings*" as an instrument. A majority of stakeholders across interests are of the opinion that net coverings are not working properly and that further development is necessary if net coverings are to contribute to conflict management. In order for that to happen there is agreement that funding is necessary.

The different groups of stakeholders have different perceptions of what a solution consist of but overall there is agreement between stakeholders across interests that the conflict is not going to be solved on a short term with the current use of instruments.

2.4 Alignment of stakeholders by storylines

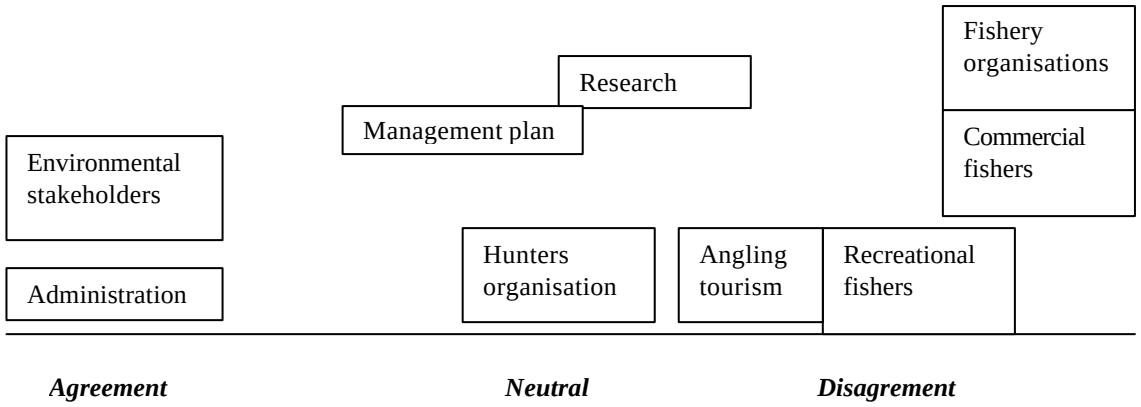
Storyline: Managers should listen more closely to stakeholders

Fishery interests is a group composed by commercial fishers, recreational fishers, their respective organizations and a fishery environmental organization and angling tourism share the view that managers should listen more to stakeholders. Managers are of the opinion that progress has been made and that they do listen today. Environmental stakeholders are composed by ornithologists and an environmental NGO, they are of the opinion that managers listen too much to fisheries stakeholders because their claims are not scientifically backed.



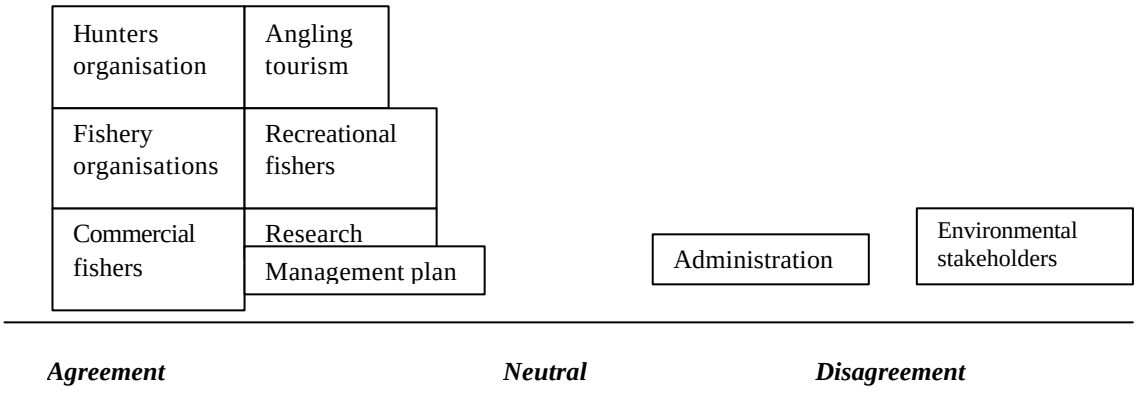
Storyline: Individual observations and oral reports are not reliable data

Both administration/managers and environmental agree that management need to be based on scientific knowledge and that fishermen's contributions are anecdotal. The researcher interviewed believes that fishermen's observations should be more integrated into the research carried out. Those experiencing the cormorant as a problem of course all disagree that their observations are not reliable. A couple of angling stakeholders were of the opinion that oral reports from anglers often are anecdotal second or third hand observations and therefore not very reliable, but nevertheless strong indications of problems.



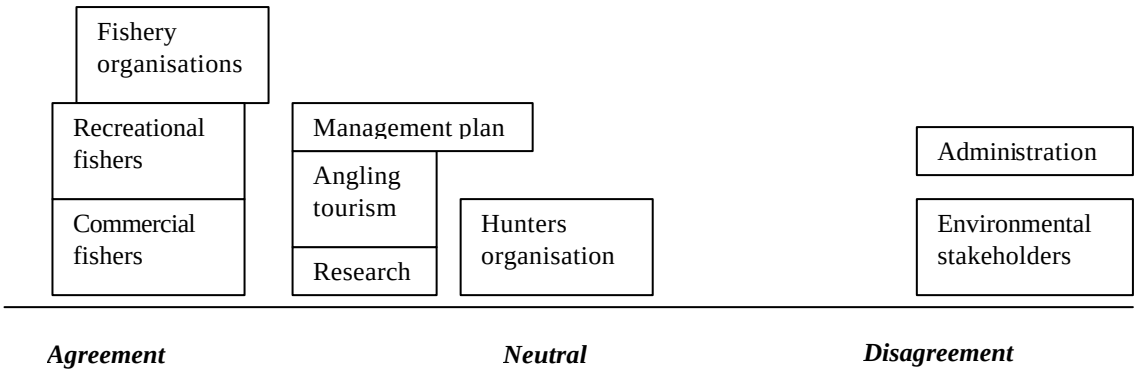
Storyline: The cormorants should be controlled

A majority of stakeholders are of the opinion that the population of cormorants need to be controlled. The management plan as well contains instruments for population control but administration/managers are not convinced of the necessity and environmental stakeholders are convinced that population control is not necessary.



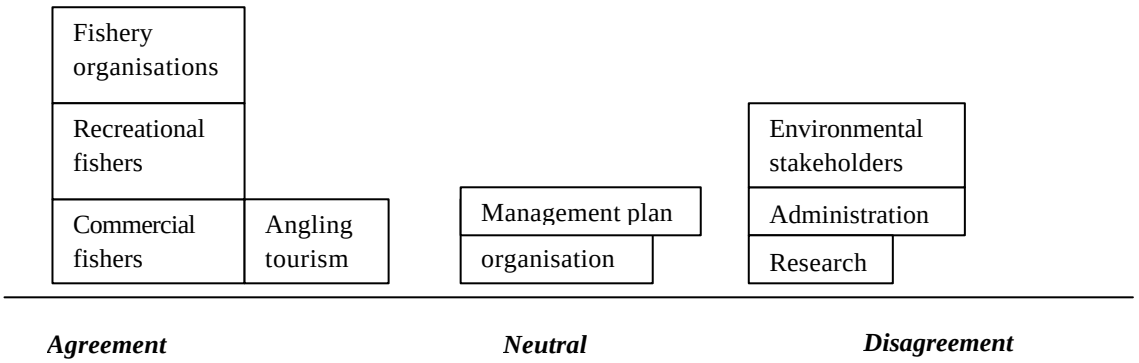
Storyline: It is the cormorants fault that the fishery is closing

All stakeholders acknowledge that other factors than the cormorant influence the fishery but fishery stakeholders claim that the cormorant is the main problem. The further the stakeholders are from the fishery sector the less they believe that cormorants constitute such a problem as described by fishers.



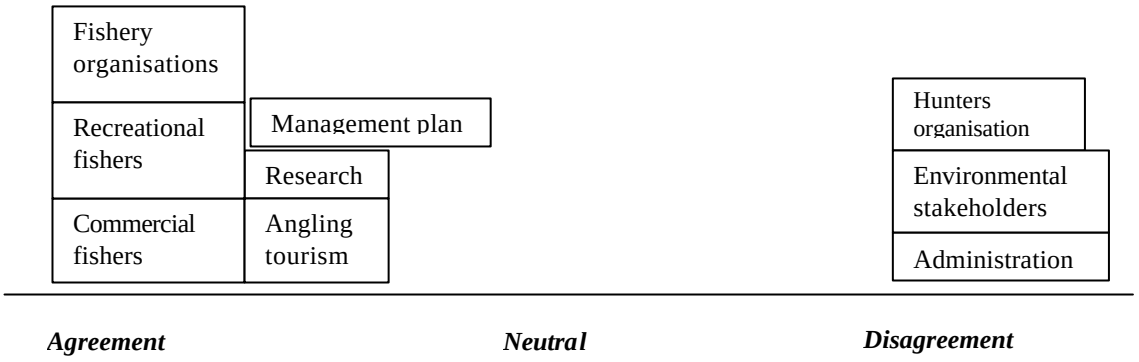
Storyline: There should be more exact information about the cormorant population

This storyline show that those not being directly involved in producing or handling scientific data have less knowledge of biological data.



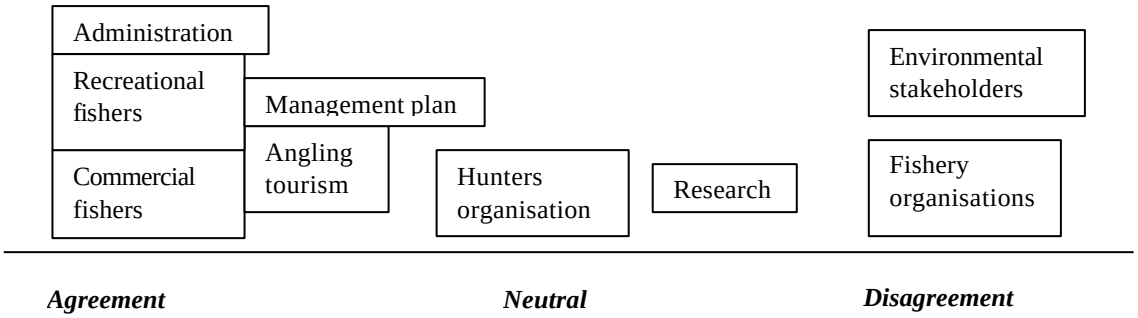
Storyline: Hunting is efficient but cannot replace other regulation measures

This storyline is interesting because reintroduction of a hunting season is a popular demand but the hunters organization disagree with the idea. It is very much a fisher storyline.



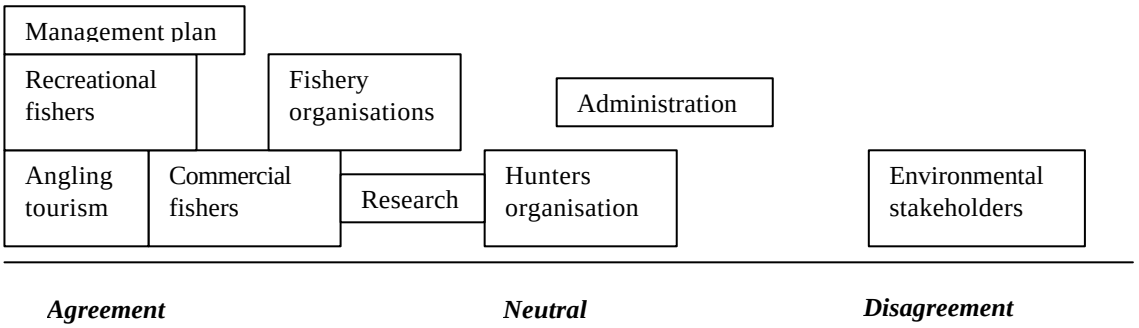
Storyline: Painting the eggs is the most human measure

For this storyline there is agreement between environmental stakeholders and fishery organizations to disagree that painting eggs is better than other measures for ethical reasons.



Storyline: When you see cormorants eating a lot of smolt it makes you angry

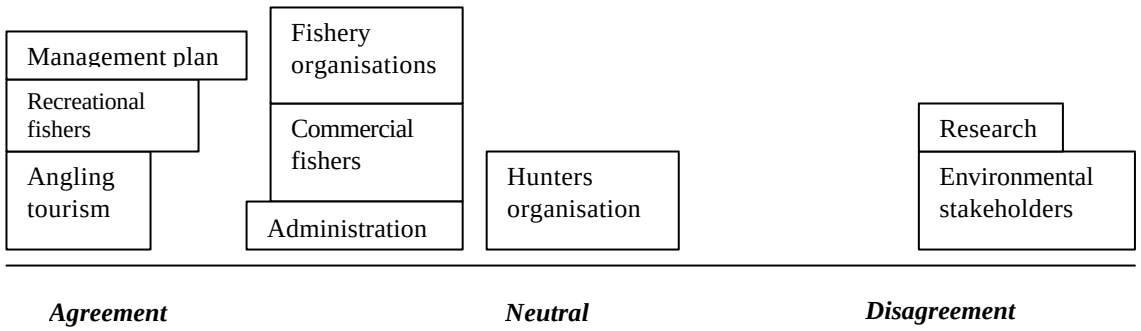
There consensus among a majority of stakeholders that the salmon issue is important but administratiors/managers are skeptical about the extent of the problem.



2.5 Alignment of stakeholders by management options

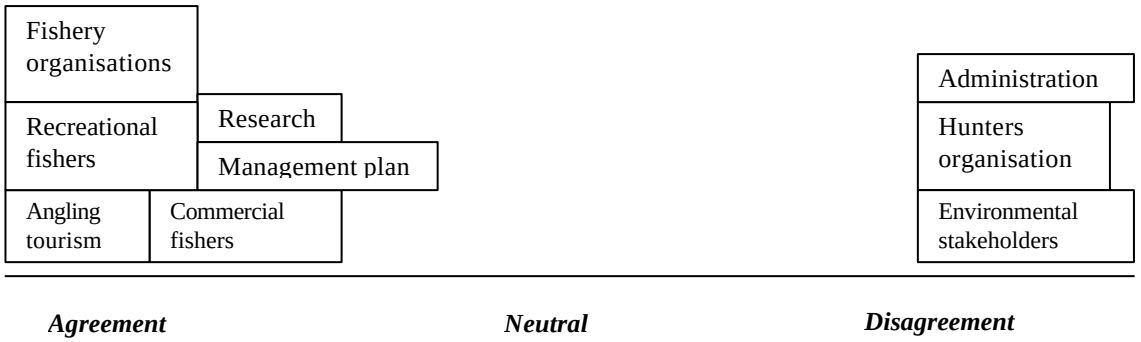
Painting of eggs

The stakeholders disagreeing with painting of eggs (oiling) include research and environmental stakeholders. The fishery organisations, commercial fishers and fishers agree but are somewhat sceptical for varying reasons.



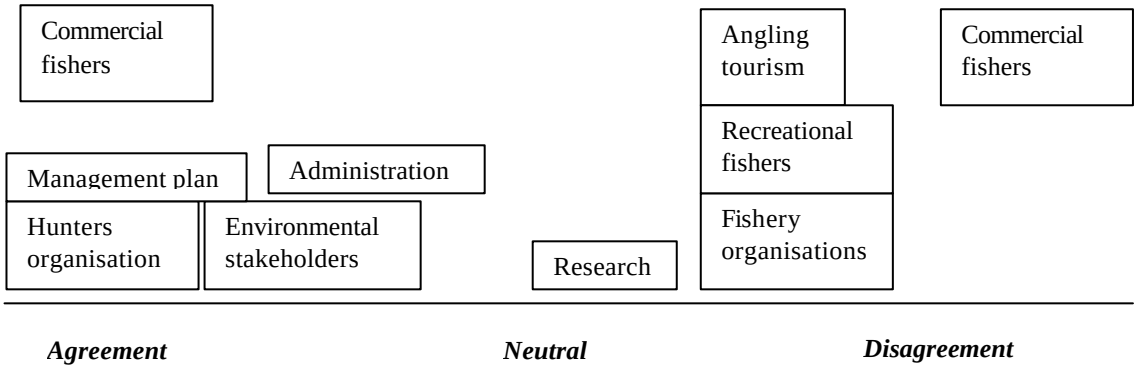
Hunting

This option is popular for stakeholders with fisheries interests of which some are hunters as well. Administrators/managers, the hunters organisation and environmental clearly disagree.



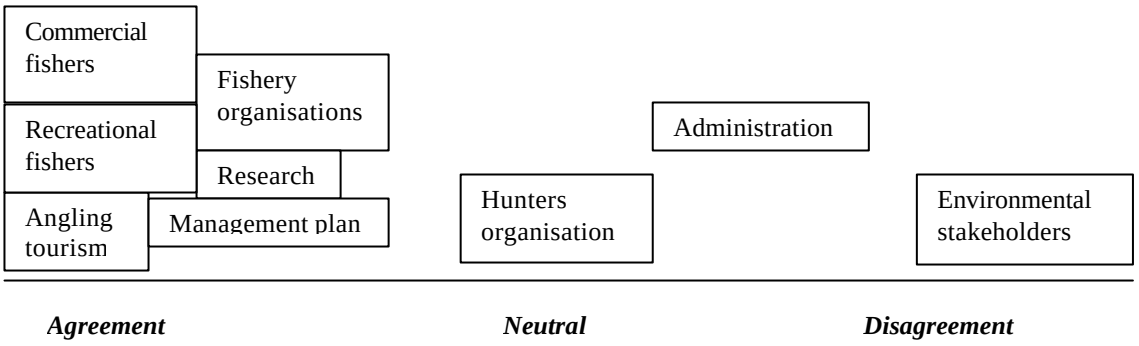
Protective hunting

Few stakeholders with personal experiences with cormorants or hunting knowledge in general agree with this option except one stakeholder with very positive personal experiences.



Deterrence (salmon smolt problem)

Environmental stakeholders are sceptical towards this management options because the deterrence is taking place in the spring period where nesting is taking place the management is potentially disturbing for other bird species. The administrators/managers to some degree share this concern.



2.6 Conclusion

Where would further knowledge be helpful

There are certain areas where further knowledge would be helpful. It is claimed by some stakeholders that the impact of cormorants on pound net fisheries, and the extent of a conflict is not sufficiently documented scientifically. When it comes to the eco-system impact of cormorants the research carried out is sparse and the complexity makes it difficult to reach conclusive result but this is an area where more research would be beneficial. Another area where more information could be helpful is the relationship between population reducing instruments as oiling of eggs and the actual conflict level. Despite the ongoing hunting experiments it seems from the interviews that more knowledge on hunting techniques is necessary instead of concluding on basis on the hunting experiments. There are experiences of several stakeholders and experiences from other countries that contradict the poor results from the ongoing experiment. It also seem to be necessary to investigate the effectiveness of the protective hunting within 1000m of fixed fishing gears as particular one respondent claims that this instrument is very effective which is contradicted by almost all other stakeholders. This calls for a dissemination of the hunting techniques and knowledge used. Net coverings are also an area where more information could be helpful. Some state that this instrument is tested and found ineffective others talk of coverings being increasingly used. There seems to be a need for a review of the fishermen's experiences with coverings.

Implications for RAP

There is already a working/advisory group in place comprised by the different stakeholders discussing how management can be improved in terms of conflict mitigation. There is a management plan in place which is has shown capabilities to adapt to developments in the conflict – in particular addressing the conflict of cormorant predation on juvenile salmon from protected stocks of salmon.
The major obstacle for the ongoing work to mitigate the conflict and improve management plan (or a RAP) is the gap between environmentalist and fishers' perception of the problem and the supporting scientific documentation. Fishers experience the problems on a daily basis whereas environmentalists, ornithologist and administrators assess the problem on basis of the scientific documentation of the problem. In particular the ornithologists demand that any further action need to be backed by scientific documentation on both the damages caused by cormorants as well as documentation for the effects of the proposed measures. From a management perspective this is sensible but there are serious problems in documenting eco-system impacts of cormorants. The complexity of factors influencing fish stocks as well as the population dynamics of cormorants is high, which makes it very difficult to reach any results that are not compromised by large uncertainties. To overcome this gap a large effort is required in research activities which unfortunately no ministry, institution or organisation is interested in funding and which the fishers themselves are incapable of. If not this, then a precautionary approach has to be taken into use and hereby force management to rely more on the indications based on fishers' experiences, rather than to await solid scientific proof of complex relations. As long as no one is interested in investigating the fishermen's claims and no one is willing to acknowledge the fishermen's claims without such scientific proof it is difficult to foresee how the fishers' role will be in a reconciliation process.

Possible lessons that can be generalized to other cases

One of the primary lessons from the cormorant case in Denmark must be that prior to a protection of a species there need to be a clear set of objectives. What is the purpose of the protection and what is the exit strategy from the protection plan if a population level is reached when a protected status is no longer necessary or desirable.
From the Danish case it is clear that a management plan is beneficial as long as it is adaptive and it is revised with reasonable intervals. However the making of a management plan also needs to be coordinated between different responsible authorities. In the cormorant management plan a range of research activities are proposed or required but it is not explicit who is supposed to finance these.

Another lesson is that the problem of different knowledge discourses need to be addressed. There is a gap between scientific knowledge and local knowledge and when arguments and perceptions originating in local knowledge are occurring persistently the decision makers and researchers need to take these seriously. If the fishers' arguments, regarding cormorant predation in pound nets, had been taken seriously 15-20 years ago the conflict would probably had evolved differently. As a consequence of the scientific knowledge being the basis for management, the legitimacy of the management is undermined when certain stakeholders knowledge is excluded.

Strategies for dissemination of knowledge and policies need to be developed and implemented for several reasons. In the case of the cormorants there is an obvious need for openness when it comes to both facts as well as uncertainties. In particular the uncertainties need to be addressed to avoid the distrust that arises when stakeholders along the way discover that e.g. mitigation instruments might not be as effective as they believed them to be and that administrators and researchers have known this for some time. Or that the size of population is measured by the number of nesting pairs but the actual size is considerably larger when including the young birds. Total estimations of the population size are more or less unknown to the public (outside research) and this has also created distrust with management decisions. In line with this there is a need to expose positive experiences from using mitigation instruments, for example shooting, experimental hunting and in some cases also net coverings.

3 FINLAND

3.1 Introduction

This report is a contribution to a EU –funded RTD project named FRAP. The project aims at developing a procedural framework for action plans to reconcile conflicts between large vertebrate conservation and the use of biological resources, using fisheries and fish-eating vertebrates as a model case. The report presents the result of a discourse analysis. It aims at understanding how stakeholders understand the conflict between conservation of grey seals and coastal fishing in the study area and what are their views about different mitigation measures. The report has a special emphasis to finding the issues and perspectives that are relevant for conflict management and collaboration between stakeholders.

3.1.1 The conflict

This case deals with interactions between grey seals and coastal fisheries in Finland. The Kvarken region in the Bothnian Bay is selected as an illustrative example of the interaction (see figure 3.1). The Kvarken region was selected because it is relevant for integration of environmental and fisheries interests in many ways. Fishermen in the area have found the damages caused by the seals almost devastating to the coastal fishery. The region is an important seal area – e.g. one of the seven seal protection areas in Finland was established there in 2001. The Kvarken region is interesting also as an area where regional authorities and stakeholders have started a planned action to deal with the controversy between coastal fisheries and seal protection. The actors are attempting to integrate environmental and fisheries considerations in a consistent way.

The problem that the regional actors are dealing with is the economic losses grey seals cause to fishing in a situation of rapidly growing seal populations. However, the number of grey seals in the Baltic Sea area has been very low and it is not certain that the population has recovered. There have been health problems that lead to reproduction problems with grey seals. Seal conservation is still justified, which makes the mitigation of damages caused by seals even more complex than it would be in a situation when e.g. hunting of seals would not create any risk for seals on a population level.

In 1906 the number of grey seals in the whole Baltic Sea have been estimated to be 88 000 – 100 000 individuals. Due to heavy hunting, the number of seals dropped to ca. 20 000 in 1940. After the Second World War hunting together with increased contamination of the Baltic Sea have effected the grey seal populations. The population was at its lowest in 1975 when there was only 3 600 individuals. (Harding and Härkönen 1999.) After that, the grey seal populations have been growing – in 1999 it was estimated that there were ca 7200 individuals (Helander 2000) and the latest count from the year 2001 was 10 300 Integrating fisheries and environmental policies 64 individuals. The number is based on a synthesis of counts made in different Baltic Sea states. Decreased hunting and increased protection of seals - and reduction of contamination of the Baltic Sea in general - seem to be the most important factors that lead to this positive development of the grey seal populations. On the subregional level changes have been even more dramatic. Especially the growth of the seal populations seems to take place in certain regions, generally in the northern parts of the Baltic Sea, around the Åland Islands and in the Bothnian Bay. For instance, in the Finnish coastal areas the (counted) number of grey seals increased from 500-600 in late 1980's to 1 900-2 200 in late 1990's (Below & Soikkeli 2000). In addition, there are certain indicators that the

behaviour of seals has changed. They forage in the areas closer to human habitation and closer to the coastline than earlier (Ylimaunu 2000, HELCOM 2001).

Figure 3.1: The research area is 'Kvarken' in the Northern Baltic Sea.

Hunting decreased in the post-war period for economic reasons and was eventually totally banned after seal protection became more and more important in the Baltic Sea area (Ylimaunu 2000). In addition, contamination of the Baltic Sea has been effectively reduced. Especially PCB and DDT contamination has caused the serious reproductive problems of grey seals (Helle & Stenman 1990 cf. Below & Soikkeli 2000).

As a result of growing number of seals in the coastal waters of Northern Baltic Sea, damages that seals cause to fisheries have increased rapidly. Grey seals are mainly responsible for the

damages. In the years 1997-1998 it was estimated that the value of catch taken annually from the fishing gear by seals was 3-8 million FIM in Finland. Damages to fishing gear was ca. 2 million FIM (HELCOM 2001). In some of the coastal areas fishing is not possible at all because of the seals (Ylimaunu 2000). There are large regional differences between the damages. For instance, in different parts of the Bothnian Bay area an estimate of the catch taken from the gear by seals varies from 40% to 5% (Helle 2002).

During several decades seals were not abundant in the coastal areas. Although the seals have always caused damages to coastal fishing, one can say that the present problem did not exist until the seal populations started to grow again in early 1990's. The situation surfaced as a real problem to the fishermen quite rapidly in the mid-90's. For instance in a national commercial fishery survey made during 1994 and 95 the seal problem was mentioned in 60 interviews of the 207 interviews made among the commercial fishermen who fish in the sea areas in Finland (Jurvelius and Salmi 1995). This is a significant observation since the seal problem was not among the issues asked in the interviews – the fishermen pointed out this themselves. The problematic relationship between seals and coastal fisheries was recognized earlier, but the magnitude of the seal problem was not realised by fisheries researchers until the interviews. In the Kvarken region the seal damage insurances paid to fishermen exceeded 100 000 FIM (ca 17 000 €) for the first time in 1995. According to the representative of a regional fishermen's association that was interviewed in spring 2002 the year 1995 formed a sort of a benchmark after which their association started to follow the situation more systematically.

The problem has become worse all the time, as the seal populations have grown rapidly. The number of seals is not the only aspect that is changing. Seal behaviour has changed in a way that changes the interaction between seals and the coastal fishery. According to the person interviewed in the regional fisheries administration, seals come closer the shoreline than they used to come - some have been seen even well up to river mouths. The area where fishermen can fish without the risk of seal damages is decreasing year by year. While seals earlier took only salmon and white fish from the fishing gear, seals today also take other species, like pike-perches and pikes.

After the late 1990's the problem has been discussed in several seminars and has been well covered in the media.

The interaction between seals and coastal fishing is not only beneficial to seals. Sometimes seals get entangled in the fishing gear and die. The seals that die in fishing gear are mostly young individuals. In 1997 and 1998 175 grey seals died in fishing gear annually in the Finnish sea areas (HELCOM 2001). However, the amount of seal by-catch is relatively small compared to the size of the seal population. The number of seal hunting licenses has gradually increased during the recent years. Hunting has allowed again in 1997 in Finland. However, hunting is limited – e.g. in the season 2001-2002 a maximum of 180 seals were allowed to be shot.

Increase of damages caused by seals is not only caused by changes in numbers and behaviour of seals, it is also related to fishing methods. Especially stationary gear like a trap net that is used in coastal salmon and whitefish fisheries today is vulnerable. During the decades when seals were rare in the Finnish coastal waters, fishing gear and fishing methods were developed to adapt into a marine environment different from the one the fishers are facing today. (Ylimaunu 2000.)

Responses of the fishers have been, on the one hand, to change their fishing gear and methods. There have been several projects to develop fishing gear both in Sweden and Finland. On the other hand, fishers pursue the right to hunt seals again, which was obtained in 1997.

The attitude to seal protection in Finland has changed considerably during the last decade. From the early 20th century the authorities started to pay bounty for seals in order to reduce the seal populations. Seals were conceived as pests like many other large predators. Authorities promoted seal hunting for over half a century. In the 1960's protection of the seals became started to carry more weight and after 1975 no bounty has been paid. In the 1980's stringent protection of grey seals forbid hunting of seals altogether, but in the late 1990's limited hunting was allowed again. (Ylimaunu 2000.) The latest development in the seal protection took place in the year 2001 when seven seal protection areas were established along the Finnish coasts. One of these, Snipansgrund - Medelkalla, is located in the Kvarken area.

3.1.2 Description of existing mitigation measures/management plans

3.1.2.1 Decision-making structure and responsible authorities

Management of the relevant issues in the conflict between grey conservation and coastal fishing in Finland fall under three administrations – fisheries, hunting and nature conservation. The structure of these administrations is presented below.

The Ministry of the Environment, which was established in 1983, is responsible for environmental protection and nature conservation policy. At regional level there are 13 Regional Environment Centres in the country. The regional centres have an important role in planning and implementing nature conservation in their areas. The Finnish Environment Institute, which is a part of environmental administration, is a research institute. Nature conservation research is one of the main research areas of the institute. It has a responsibility of combining national environmental monitoring data. The Forest and Parks Service handles management of protected areas within their regional units (6 units in Finland).

The Ministry of Agriculture and Forestry is responsible for fisheries policy. The Ministry is also in charge of hunting. This is interesting for the conflict, because grey seal is classified as a game animal in Finland. This means that decisions on the hunting restrictions of grey seal are made under Hunting Act by the Ministry of Agriculture and Forestry. In the Ministry the same unit, i.e. the Fish and Game unit, is in charge of both fisheries and hunting policy.

Game management administration has also a regional structure. The ministry in charge of the policy that is implemented in 15 Game Management Districts. Under the districts there are 298 Game Management Associations. The districts and associations are hunter's organisations as well as game management authorities. In other words, implementation of hunting policy is delegated to hunters to a certain extent.

Finnish Game and Fisheries Research Institute (FGFRI) is a research institute of the fisheries administration. It conducts fisheries research and is responsible for monitoring the state of commercially exploited stocks. The Institute gets monitoring data from the regional authorities. It also monitors the stocks of game animals in Finland. The institute monitors grey seal populations.

At regional level fisheries policy is implemented by the Fishery Unit of the Employment and Economic Development Centre (so-called TE-centre). The Centres monitors and supervises fisheries in their regions and administers structural funds and other financial resources. There are 15 TE-centres in Finland.

Coastal waters up to 500m from the 2 m depth curve are privately owned in Finland. The ownership is based on the system that land property by or near shorelines includes a right to certain water area. Adjacent water areas are managed by statutory fishery associations (SFAs) in a sort of co-management arrangement. Associations give or sell fishing permits on their areas, which determine where fishermen can fish. Since 1982 the state introduced a new management system – Fishery Region – that aims at management of wider water bodies than the statutory fishery associations. Water areas of statutory fishery associations, water areas managed by individual owners and state's waters near the coast were combined into Fishery Regions. There are three fishery regions in Vaasa sub region..

3.1.2.2 Mitigation measures

The policy instruments discussed in the report are divided into three groups: command-and-control instruments, economic instruments and activities directed at civil society. There are seven different instruments in use in the Finnish study area that can be categorised in the three policy instrument groups. These are 'Regulation of hunting', 'Designation of grey seal reserves', 'Compensations 2000-2001', 'Fishery insurance', 'Funding spread of technical measures', 'Stakeholder forum' and 'Training of seal hunters'. There is eighth mitigation measure, 'Change of fishing practices', which is fishermen's own voluntary action that is not accompanied with any public policy instrument. The conflict started to escalate in mid-1990's and most of the instruments are developed and introduced after that. The situation is dynamic and still developing, but many of the instruments have been practiced already for several years and some of the instruments are well established and stabilised. Mostly the instruments have also quite solid legal and institutional background.

3.1.2.2.1 Command-and-control instruments

There are two relevant command-and-control instruments in the Finnish case. The first one is hunting of seals and the second is designation of grey seal reserves.

Regulation of **grey seal hunting** is one of the policy instruments. Hunting is regulated by determining the maximum number of killed seals and by closed seasons. More detailed regulations control hunting methods.

Hunting as a mitigation measure has been used in Finland since 1997. At first hunting was only meant for scientific purposes and to target individual seals that are known to take fish from fishing gear. In the first year licences to kill 30 grey seals were granted. Gradually the number has been increasing has been increased, so that during the hunting season 2003/2004 it is 395 individuals. The model region is a part of the Swedish Ostrobothia Game Management District where the regional quota in the season was 110 individuals. (Hunters' Central Organisation 2004.)

The hunting season has also been made longer. The grey seal hunting season was at first from September 1st to October 15th and from April 16th to May 31st, but since the hunting season of 2000/2001 it has been from August 1st to October 15th and from April 15th to July 31st. Seal hunters have especially strongly emphasised the importance of ice-season hunting, since at that time the hunting can be done efficiently without the fear that seals will drown after they

have been shot. In 2003 the hunting season was again expanded, now starting in April 16th and ending December 31st. (Kvarken Council 2003). The period when the pups are lactating has been kept as a closed season, although the length of this closed season has been criticised.

The hunting of grey seals is controlled by a license system that determines regionally how many seals can be shot during a hunting season. The Ministry of Agriculture and Forestry determines the size of regional quotas based on the scientific advice provided by the Finnish Game and Fisheries Research Institute. The Ministry of the Environment is also heard in the process. Since 2002 there has been an official quota system, but already before that the maximum hunting volume was determined and allocated regionally. Game Management Districts grant hunting licences to hunters and they also monitor hunting. At first when hunting was allowed again licences were granted to individual hunters. Today hunting licence system has become more flexible since the hunting season of 2002/2003. The Game Management District still grants licences to individuals. They can give it further to other hunters, but they have a responsibility to report to the Game Management District when the licence has been used. A licence gives a right to kill one grey seal, but number of granted licences can be higher than the regional quota. Hunters have an obligation to report when they have used they have shot a seal. Hunting is stopped when the quota is full.

The licence also stipulates legal hunting methods. For instance, grey seal hunting is allowed only with a rifle and with a trap that does not kill seals. However, trapping is not practiced. The licence also includes an obligation to send intestines of killed seals to the Finnish Game and Fisheries Research Institute.

Table 3.1: Grey seal hunting statistics in Finland (granted licences, killed individuals and quotas). Vaasa, Maalahti and Vöyri game management associations cover the model region. The model region hunting statistics is a combined statistics from these areas. The full data from hunting season 2003/2004 is not available yet. (Source: Hunters´ Central Organization 2004)

Hunting season	Granted hunting licences	Killed seals	Quota
Whole country			
2000/2001	71	30	100
2001/2002	203	90	180
2002/2003	288	116	230
2003/2004	418	N.A	395
Swedish Ostrobothnia Game Management District			
2001/2002	88	45	60
2002/2003	145	78	80
2003/2004	216	N.A	110
Model region			
2001/2002	71	35	-
2002/2003	85	47	-
2003/2004	108	N.A	-

The main purpose of the **grey seal reserves** is to protect the most important haul-out areas of grey seals. The reserves can be seen as one of the policy instruments in the conflict. They are not intended to decrease the damages to fishery. On the contrary they may in fact increase them, but they have proved to be an instrument that the environmental sector has found positive after the hunting volumes have been increased gradually.

In 1995 the grey seal working group of WWF Finland proposed to the Ministry of the Environment that Finland should designate grey seal reserves. The background of the designation was the HELCOM recommendation 9/1 on the protection of seals in the Baltic Sea and the EU Habitats directive. (Bäck *et al*. 2004.) The required grey seal conservation measures in the HELCOM recommendation include designation of protected areas. According to the Habitats directive grey seal belongs to such species that important habitats should be protected. The Ministry of the Environment started the preparation that was finalised in 2000. Seven grey seal reserves along the Finnish coasts were designated in 2001. The reserves are divided into two spheres. Traffic in the core area of the reserve is forbidden. Hunting as well as fishing with fishing gears that may cause harms to seals is forbidden in the whole area.

Grey seal reserves were first proposed already in 1980's (Bäck *et al*. 2004). In 1989 the Finnish Game and Fisheries Research Institute (FGFRI) proposed designation of six grey seal reserves in Finland. The proposal was made to the Ministry of Agriculture and Forestry (MoAF). The FGFRI proposed that rather small areas around central islets of seals' haul-out sites would be protected from disturbance. Each of six reserves would cover approx. 67 ha. The MoAF's respond was negative. The seven seal reserves designated in 2001 cover much higher areas, together the reserves cover 19 150 ha (Metsähallitus 2004).

One of the grey seal reserves – Snipansgrund-Medelkalla – is located in the model region. It covers an area of 3 260 ha. It is located in the municipality of Mustasaari.

Finnish Game and Fisheries Research Institute is assessing the impacts of grey seal reserves on coastal fishing, behaviour of seals and on wild salmon stocks. The assessment results will be reported in 2006. Today it is impossible to anticipate the final outcome of assessment, but assessment may bring changes on the restrictions on the traffic and use of grey seal reserves.

3.1.2.2.2 Economic instruments

There are three relevant economic instruments in Finland: two compensation mechanisms that are used to mitigate the damages seals cause to fisheries and funds used in development of technical mitigation measures.

One of the compensation mechanisms is a **compensation paid to professional fishermen on the basis of loss of catch caused by seals**. Compensations has been discussed since late 1990's when for instance WWF Finland proposed together with fisheries organisations that FIFG funds should be used in compensations. The compensations that were actually paid were initiated in a working group that discussed about the future of coastal salmon fisheries in Finland. The working groups worked under the MoAF and published its report in 2000.

Compensation of the damages caused by seals to fish catch are included in the Hunting Act together with damages caused by e.g. wolfs, bears and wolverines to reindeer herding. Compensations, that were paid in the spring 2003 on a basis of Council of State's decree 442/2002, were administered by the department of Fisheries and Game of the MoAF.

A permanent compensation scheme was not accepted by the European Commission on the basis of EU regulations on state aid (87th article of the EC Treaty) and Finland was allowed only to compensate damages of the years 2001 and 2002. The seal damages were seen as an exceptional and unexpected incident because seal populations have been growing so fast. The member states can compensate this kind of damages. The European Commission in it respond to Finland took a view that damages caused by seal are a natural part of fishing and therefore should be accepted. (European Commission 2002.)

The damages were supposed to be compensated according to an average level of seal damages in different region. The regional fisheries authorities estimated the damages together with regional fisheries sector representatives. A study conducted by FGFRI about the damages was also used while the ministry determined how large the average damage is in different region. In the end the proportion of compensated damages was a result of available resources - 1,7 million € - not a planned proportion. Only 22,76 % of the damages were paid to the professional fishermen who applied for compensation. The magnitude of applied compensations was not anticipated. The MoAF will pay the rest of originally planned compensations in 2004 or 2005. A permanent compensation arrangement does not seem to be likely, but this is an issue that Finland has tried to change.

Table 3.2: Compensations to damages on catch in 2000 and 2001 in the model region. In 2003 22,76% of the compensations was paid. The rest will be paid in 2004 or 2005. (Source: Ostrobothnia Centre for Employment and Economic Development)

Municipality	Fishermen who got compensations	Amount paid in 2003	Total amount of compensations
Mustasaari	19	92168,98	404960,37
Korsnäs	3	11730,63	51540,55
Maalahti	9	30282,13	133049,78
Maksamaa	2	16916,06	74323,64
Vaasa	9	38159,01	167658,22
Total	**42**	**189256,81**	**831532,56**

Compensations were paid to professional fishermen, of whose catch seals have taken or damaged more than 20%. There was also a deductible proportion of 250 euro per year that fishermen had to cover themselves. Only professional fishermen (more than 30% of income comes from fishing) were eligible for applying compensations. The system took account only the damages to catch in the fishing gear. The impacts of seals on fish stocks were not compensated.

Fishermen have another opportunity to get seal damages compensated. There is an **insurance system that covers damages to fishing gear**. The insurance system is a permanent system that covers damages to fishing gear and equipment. It was established already in 1930's. This system is applied to damages caused, for instance, by harsh weather conditions (e.g. ice). The system covers also damages caused by seals. Since 1995 the insurance payment system

started to separate seal damages as a separate cause of damages. Earlier they were included, but not separated.

The insurance system is organised in regional fishery insurance associations. The insurance system is partly financed by insurance charges and partly by the state. In this sense it can be seen also as policy instrument directed by the state. Only professional fishermen (more than 30% of income comes from fishing) are eligible in the system. The fishermen have to cover part of the damages themselves (a deductible proportion). It is 25% of the estimated damage in case of gill-nets. The state subsidises 40% of the amount paid to fishermen. Regarding other fishing gears the deductible proportion depends on the value of damages. If the value is less than 504 euros (3000 FIM) the system is the same as above. If it is 504 euros or more the fishermen covers 25% of the damage up to damage of 504 euros and 5% of the damages above that amount. State subsidy to the insurance association in this case is 40% of paid amount up to 504 euros and 90% of the rest of the compensation. (Österbottens fiskeriförsäkringsförening 2002.)

In 1998 fishery insurance associations paid 90 000 euros to fishermen because of the seal damages in the whole country – 2/3 of the sum was paid in the model region.

Technical measures to reduce the damages have been developed. A seal-proof fishing gear is a fishing gear construction structure or material of which has been modified in order to avoid seals from taking fish from fishing gear or breaking the gear. Only fish-trap like fishing gear, like pound-nets that are used in salmon and white-fish fisheries in the region, can be modified to a seal-proof fishing. Other technical measures that have been tested (in Sweden) are deterrent or scaring devices, but they have not been working. Technical measures cannot be applied to gill-net fishing, either floating or bottom nets.

In terms of policy instruments **funds are available for developing and testing fishing gear** that is less vulnerable to seal damages. There are two examples of such activity in Finland. One is in the model region where testing of such fishing gear has been funded in a regional project dealing with the seal problem. The other is the development work done in the Finnish Game and Fisheries Research Institute that has been continuing since late 1990's. The latter work is of lesser relevance to the model region. There is exchange of experiences between the model region actors and FGFRI, but FGFRI has concentrated its field tests to another region. Here we concentrate on the regional activities, i.e. testing and spreading information about seal-proof fishing gear.

A three-year project "Grey Seal in Kvarken" (see below) that was started in 2001 to deal with the problems that seals cause to fishing had as one its main goals to test and spread information about so-called seal-proof fishing gear. The active project partner in testing was a regional fishermen's organisation, Österbottens Fiskarförbund. During the fishing seasons 2002 and 2003 seal-proof fishing gears (trap-nets) have been tested in the model region. The tests in the regions are continuing gear development projects in Sweden. The gears have been manufactured in Sweden. The project rented these gears from the Swedish manufacturer and from the FGFRI. At the first season there was one trap-net that was tested and a year later the number of gears was four. The gears were given to fishermen for whom the fisheries authorities gave a special permission to start salmon fishing earlier than the season was opened.

The whole project is funded mainly from EU structural funds, INTERREG Kvarken-Mittskandia IIIA. Other funding is from the Kvarken Council/The Nordic Council of Ministers, the County Administration of Västerbotten in Sweden and Employment and Economic Development Centre of Ostrobothnia in Finland.

The regional fishermen's organisation continues testing and promoting the use of the gear. They have applied funding for continuing this work from a private fund that supports development of coastal fishing. The organisation plans to buy a few gears so that they could be tested for a longer period and in several locations in Kvarken.

Technical mitigation measures are being developed in the Finnish Game and Fisheries Research Institute. In the future new solution can become available. A recent development regarding funding the seal-proof fishing gear is a change that was in 2004 to the Fishing Decree. The change makes seal proof fishing gear eligible for subsidies from FIFG funds, since now such gear can have a definition of 'a professional fishing gear'. However, any cases of such subsidies are not yet available. The decision is very recent and its effects will realise only in the future.

New more active fishing methods are being developed also. So far, fishermen them selves have changed their fishing, e.g. from stationary fishing gear to more active fishing methods with some positive results. Now also fisheries organisations in Finland and Sweden are starting more coordinated work on this kind of testing and developing. This is also a matter that might change in the future.

3.1.2.2.3 Activities directed at civil society

A creation of a stakeholder forum during the Kvarken Council's project "Grey Seal in Kvarken" is the most relevant of the activities directed at civil society. Another policy instrument of this type is training of seal hunters, which was in fact done also under the Kvarken Council's project. The creation of stakeholder forum can be seen as a policy instrument that aimed at mitigating the conflict between stakeholders, whereas the training had a clear practical goal of improving the skills of hunters. This is why the latter policy instrument is discussed separately.

The Stakeholder forum in Kvarken Council's "Grey Seals in Kvarken" project was started in 2001 to bring regional stakeholders together to discuss about the problem between seal conservation and coastal fishing and to create solutions. This policy instrument aims at mitigating the conflict between stakeholders.

The regional actors that were already involved in different projects under the Kvarken Council started to discuss about the problem in late 1990's. They started to prepare a project to deal with it. The Kvarken Council was an appropriate forum for co-operation, since there already was a lot of co-operation between the actors either related to fisheries or to environmental issues under the Kvarken Council. Also the problem itself was the same on both sides of the Gulf of Bothnia. In addition, the seal population is the same.

The main actors in the discussions were regional fisheries organisations (Österbottens fiskarförbund in Finland and Fiskareförbundet Västerbotten in Sweden), hunters organisations (Svenska Österbottens jaktvårdsdistrikt in Finland and Jägareförbundet in Sweden), regional environmental authorities (Regional nature protection unit of Parks and Forest Service and the West Finland Regional Environmental Centre from Finland and Västerbottens Länstyrelsen

from Sweden), regional fisheries authorities (fisheries unit in the Ostrobothia Employment and Economic Development Centre in Finland and Västerbottens Länstyrelsen from Sweden).

When the content of the project was discussed environmental authorities in both countries wanted the project to have a rather strong emphasis on biological research on seals (population trends and seal's behaviour). At that time the project was thought to be included into a larger frame of environmental co-operation in the Kvarken region that is one of the main forms of co-operation in the Kvarken Council. However, the fisheries and hunting sector representatives wanted the project to concentrate on promoting hunting and developing practical solution in fishery to minimise the seal damages. In the end, the environmental sector's perspectives were not given as high importance as they would have wished. When the proposal was formulated the project mostly concentrated on the issues that fisheries and hunting sectors had preferred. It was then decided also that the project will not be a part of the environmental co-operation under the Kvarken Council, in stead it will be an independent project in the Kvarken Council's project portfolio. This influenced environmental sector actors' contribution to the project. They did not withdraw completely from it, they had representatives in the project's steering group, but they did not invest a lot of resources in form of work input to it, either. Another aspect is that, had the project be included in the framework of Kvarken region's environmental co-operation, it would have got a stronger, or at least different, institutional setting. Since the project implementation progressed well, it cannot be argued, though, that it lacked something that a stronger institutional backup would have contributed.

The project was funded mainly from EU structural funds, INTERREG Kvarken-Mittskandia IIIA. Other funding is from the Kvarken Council/The Nordic Council of Ministers, the County Administration of Västerbotten in Sweden and Employment and Economic Development Centre of Ostrobothnia in Finland.

The main objectives for the project were to

- find a common understanding about the seals' role in the Kvarken region's ecology and about the problem
- reduce the seal damages by developing fishing gears
- perceive grey seal as a renewable and utilisable resource, use of which can become an income generating activity

Project activities concentrated on informing the public and the national and even international level actors about the problem, fishing gear development, training of hunting and development of seal products. The project started with the first objective, to find a common understanding about the seals' role in the Kvarken regions ecology and about the problem. The first goal can be seen as the most important in reducing the conflict between stakeholders. And this is the aspect that we will concentrate below. The project's gear testing activities were already discussed above and the training of hunters is discussed below.

The project published a regional plan of action to deal with the seal question (Kvarken Council 2003). The plan suggested actions to be taken both in the region, but also on national and international level. In fact, the plan starts with suggestion on international policies and continues with discussion about national level policies. Many of the suggested activities are such that to be implemented national policies and legislations need to change.

The activities started in the project continue in another project that started in 2004.

The Kvarken Council's grey seal project had as one of its objectives to make grey seals perceived again as a renewable natural resource in the area (Kvarken Council 2003). This idea was promoted e.g. by developing seal products and by training seal hunters. **Hunting training** is closely related to the conflict, since hunting is seen one of the most important mitigation measures in the conflict.

The project has organised two hunting courses, one in Sweden and one in Finland. Both courses had little less than 50 participants. Since hunting was not practiced between late 1970's to mid-1990's the project found it necessary to organise training courses. The courses concentrated in practical hunting training, safety issues, processing of seals and in hunting ethics. The project will also produce training material that can be used by hunters clubs in training their members.

3.1.2.2.4 Other measures

The last mitigation measure is a **change of fishing practices**. It is not supported by any policy instruments – it is fishermen's voluntary activity when they try to adapt to the damages that seal cause to coastal fishery. Some of the fishermen have given up fishing with stationary gear. Today they concentrate on gill-net fishing in a new way. They keep nets in the water only for a short period and change locations where they fish. For some fishermen this has been a quite successful strategy. Since the measure is a voluntary one there are not records of it at information about it is gained only from interviews. Similarly it is difficult to assess whether it is an efficient adaptation or not. It is an effective one, according to interviews, but it also raises costs of fishing, but it is not possible to assess how much. In the future further interviews with fishermen and regional fisheries association representative are needed.

3.1.2.2.5 Summary of mitigation measures

The problems that seals have caused to coastal fishing in the model region have been quite severe since mid-1990's. A lot of mitigating activities have been tried and are practiced today. There are a lot of different actors on local, regional and national levels involved. The actors represent different sectors (fisheries, environmental and hunting). Both authorities and NGO's from these sectors have been active. This clearly is a positive aspect of the Finnish case: involvement of many kinds of actors has brought quite much resources in mitigating activities and kept the scope of activities large. Furthermore large interest in the issue enhances the continuity of mitigating activities.

High number of available mitigation measures is a strength. Most of them are specially planned to mitigate this conflict and have also quite solid legal and institutional background. The following table summarises the mitigation measures. Even though there are many relevant instruments available, the problem is getting worse. Grey seal populations are growing and so are the damages they cause to coastal fishing in the area. Fishermen and their representatives as well as fisheries administration in all levels in Finland see that grey seals are posing a severe threat to the industry. It is evident that none of the practiced policy instruments is very effective in reducing the damages that seals cause and also that together they do not form an effective combination of policy instruments. Only four of the measures are directly mitigating the damages, namely, compensations, fishery insurance, hunting and a change of fishing methods. However, when we talk about conflict mitigation we should also pay attention to relationships between stakeholders. One of the mitigation measures is deliberately addressing this issue. The Kvarken Council's grey seal project has done valuable work in this respect and succeeded to bring the views of stakeholders closer to each other.

The project is continuing, which should help to find common ways of working together also in the future.

The situation is a dynamic one. Many of the instruments are such that their effects will be materialised in the future. For instance, seal hunting has been practiced in relatively high volume only very recently, two or three years. Hunting is thought to bring effects when seals learn to be afraid of humans and move away from fishing areas. This takes time. Similarly, technical measures have not been used very commonly so far. The policy instrument related to technical measures has been to fund testing and promoting so-called seal-proof fishing gear. Effects of this activity may become concrete only in the future. In this year, 2004, a new economic instrument has become available to fund investments in these gears. This may bring some effects in mitigating the actual damages that seals cause. Technical measures are also continuously developed. The latest development is testing of active fishing methods to avoid seal damages. This also may bring important changes in the future.

Another aspect in the Finnish model conflict is that most of the practiced mitigation measures are accepted by stakeholders, which is an important factor for future development. Even the seal hunting has not been very controversial issue. So far the trend has been a steady increase of annual hunting quota. If it will keep growing, the attitude of environmentalists toward the Finnish seal hunting policy may change and this can change the nature of conflict. Today the conflict is not a one that is clearly polarised between certain stakeholder group, but rather a problem of handling negative side-effects of successful seal conservation policy.

Table 3.3: Synthesis table of the mitigation measures in the Finnish case. The instruments are assessed individually in relation to their mitigating effect. The last row discusses the probable future development.

Mitigation measures	Seal hunting	Designation of grey seal reserves	Compensations of catch damages 2000-2001	Fishery insurance	Testing 'seal-proof' fishing gear	Stakeholder forum	Training of seal hunters	Change of fishing method
Mitigating effect in relation to the model conflict	Change seals behaviour (and control seal populations)	Calms environmentalists	Eases economic losses	Eases economic losses	Raising awareness about technical measures	Better relationship between stakeholders	Hunting becomes more effective and ethical	Helps to avoid seal damages
Future of instruments	Increase Hunting quotas will probably grow. A possibility of protests	Stable Reserves will most likely stay, but small changes in restrictions are possible	Not practiced Unlikely that will be paid in the future	Stable The system is permanent	Changes Is being redirected and becomes even more relevant than today	Continues New project between stakeholders has started	Continues Training continues, but on the local level	Increases? Development of theses methods will be coordinated

3.2 Description of the story lines

The results of a discourse analysis are presented in chapters 3.2 and 3.3. Discourse analysis is one of the qualitative social science research methods. The material used in discourse analysis is usually semi-structured interviews. Other material that is in a form of text can be used as well. In this study the main material in the analysis has been interviews conducted in the study area and in Helsinki, Finland's capital city. The aim of the discourse analysis is to draw a picture of how the conflict is understood by different stakeholders and how different aspects of the interactions between seal conservation and coastal fishery are connected to each other. To achieve this, the analysis concentrates on the ways of argumentation in the interviews. The assumption here is that the ways of thinking and connecting different topics together reflect how the stakeholders see the conflict as a whole. Finding out stakeholders' views or opinions about individual topics (e.g. different mitigation measures) is necessary, but not sufficient for understanding how stakeholders comprehend the conflict. People's opinions about individual topics can be studied perhaps the best by using quantitative survey methods, but qualitative methods are more able to study lines of reasoning in a way that tries to grasp the stakeholders own way of thinking.

Qualitative research methods, like all methods, have their limitations. One limitation is problems in the research materials representativeness. The material for qualitative research is not usually collected by the similar sampling methods and according to same criteria that is used in quantitative social research. Thinking behind sampling in qualitative research in non-probabilistic unlike in quantitative research. Sample sizes in qualitative research, especially in studies that use as its main material vast and complex semi-structured interviews, are small, which brings with it the problem of representativeness of the material. Partly this problem is reduced by the way interviewees are selected. This study aims at finding different stakeholders' ways of understanding the conflict. Persons to be interviewed should represent different types of individuals in the stakeholder groups. Selection of the interviewees is a cumulative process. Interviews inform the researcher about new stakeholders and about different types of individuals in the stakeholder groups. The interviewees are thus not randomly selected individuals. They are purposively selected as representatives for variation among stakeholder groups. Even if this reduces the problem significantly it does not solve it altogether, which must be kept in mind, while analysing and reporting the results. The views presented in the interviews are thought to represent the views of stakeholders, but the research results cannot be statistically generalised to the stakeholder group.

The interviewed persons are selected to represent different stakeholders and different types of individuals in a stakeholder group. Identification of the stakeholder groups is a cumulative process that in fact continues throughout the analysis. Composition of a stakeholder group is an empirical question – they cannot be defined in beforehand. A researcher has a basic understanding of the studied situation and what kind of groups there seem to exist when the selection of interviewees is started. However, the identification of stakeholder groups comes more precise when the analysis progresses and it must be kept open to changes. To a certain degree there is a clear and conscious intention to cluster interviewees into groups in a way that still respect the variations in the material. Therefore, the groups are not uniform and there is intra-group variation. On the other hand, the identification of stakeholder groups is not completely exclusive. Some of the individuals have characteristics of more than one group.

In this study the views and lines of thinking identified in the interviews have been the main criteria of defining stakeholder groups. There are five main stakeholder groups that can be identified in the Finnish model case. The first one is *'fishermen'*. These are the coastal fishermen. The second group is *'hunters'*. All of the fishermen that were interviewed have hunted seals. Their talk about seal hunting is also used in presenting the views of 'hunters'. Especially their talk about hunting practices and other aspects of hunting that they do not connect very closely to the interaction of seals and fishery. Game management authority's views are that much similar to the views of hunters so that game manager is included in this group. Third group is called *'fishery organisations'*. It includes fishermen's organisations as well as fisheries authorities. Their views are rather similar with each other and in relation to fishermen there were certain differences. *'Environmental interests'* is a name of the fourth group. This group consists of the environmentalists and environmental authorities. Also their views are quite close to each other. The last group is *'tourism entrepreneurs'*. Only two of the interviewed persons belong to this group and one of them belongs also to the group '*environmental interests*'.

Storylines are based on a qualitative analysis of 22 interviews conducted in 2003 and 2004. Also one interview conducted in 2002 was used as a material for discourse analysis. Interviews were conducted in the model region and in Helsinki (see 0). Other material has been used as well to support interpretation of the results. This consists of written material published by the stakeholders and newspaper articles where stakeholders' views are presented.

Table 3.4: Interviewed persons

Interviewees	**Number**	**Locations**
Fishermen	4	Mustasaari and Maalahti
Fisheries authorities	2	Vaasa and Helsinki
Fishery organisations	2	Vaasa
Seal hunters[3]	1	Mustasaari
Game managers	1	Vaasa
Environmental authorities	3	Vaasa and Helsinki
Environmentalists	3	Vaasa and Mustasaari
Kvarken Council	1	Vaasa
Municipality officials	2	Mustasaari
Summer dweller	1	Mustasaari
Biologists	1	Helsinki

[3] All of the interviewed fishermen were also seal hunters.

Tourism entrepreneurs[4]	1	Vaasa

The interviews were recorded[5] and the main research material was detailed notes written from the recorded interviews. The material has been analysed with a NVivo software that is developed for qualitative analysis of material that is in a textual form. During the analysis the material was categorised into themes talked about in interviews. A theme is a small passage of talk concentrating on one specific issue, e.g. seal population's size. With the help of the software talk about different themes and their connections to other themes in all interviews can be studied.

Results of this discourse analysis are presented in a form of storylines. Storylines are consistent discourses extracted from the interviews. They describe the lines of thinking that could be identified in the interviews. They are constructed as a result of the analysis and they all represent views of several interviewees, but there are also interviewed persons that do not agree with the views presented in the storylines. Use of storylines gives an opportunity to discuss about relatively large phenomena that are related to the relationship between seals and coastal fishing. It also makes it possible to study different positions that the stakeholders have towards these phenomena. How stakeholders agree or disagree with the storylines is discussed after the presentation of the storylines.

Four storylines are presented below: 'The grey seal problem', 'Reintroduced seal hunting', 'Seal conservation policy' and 'Kvarken Council's grey seal project'. There were also other storylines in the interviews. The storylines presented hear are the ones that are most relevant regarding the conflict and conflict management.

Storylines are quite large. Therefore in a more detailed presentation of the discourse analysis results the storylines are divided into sub-themes. They present stakeholders views and opinions about individual things related to the conflict. The sub-themes are presented in a form of an assertion to help to identify different stakeholders' views about them. This is needed especially, since most of the disagreements between stakeholders are not very strong. In order to improve the conflict management even less dramatic disagreement may become important.

3.2.1 Storyline 1: The grey seal problem

Problems that seals pose to the coastal fishery is the topic of the most important story line in the interviews conducted in the Finnish model region, Kvarken. Of course, it is the obvious one, but its high importance in the interviews is not only a result of interviewer asking about the problems that seals cause. The problems have been discussed in the region already since late 1990's. The issue has had high media coverage since that time, for instance in a regional newspaper called "Vasabladet". It is the region's most important Swedish language newspaper. It is a generalised newspaper subscribed to 25 400 households without any specific focus on fisheries or nature conservation. Seals and fishery have been discussed frequently in the paper, which reflects the

[4] One of the environmentalists was tourism entrepreneur. Views of this interviewee are used as representing tourism business views, in addition to the tourism entrepreneur interviewed.

[5] Due to technical problems two of the interviews were not recorded on minidisc, but the notes were handtyped during the interview.

importance of the issue in the region. Between May 30, 2001 and October 19, 2003 there was 25 stories that dealt with either fishing or seals in the region. Only 5 of these stories were such that did not mention the conflict. The newspaper is an interesting source of information, because it presents views of different stakeholders, but also have a potential of influencing perceptions people have.

Different mitigation measures (see chapter 3.1.2.2) were discussed often in relation to the problem itself. The stakeholders' views about mitigation measures are, however, presented separately in chapter 3.3.2 below. They are presented separately, because mitigation measures' connection to a conflict management is more concrete than of the storylines. The storylines helps to understand the conflict and different stakeholders' positions towards it, whereas the talk about mitigation measures is talk about the conflict's solutions.

The storyline about the grey seal problem reconstructed from the interviews conducted during a period of 12 months starting from late spring 2003 is the following.

Seals are the biggest single problem of coastal fishery today in Finland and in Kvarken. If solutions to it are not found, there is a danger that the whole fishery will be lost. Fishery has been declining for a long period and there are other factors behind this developing. Fisheries regulations especially in salmon fishery, fluctuations of fish stocks, and decrease of prices together with raising costs are important other reasons, but seals are the most important of the factors.

The problem started to escalate during the 1990's. In 1970's and 1980's seal populations were so small that seals were seldom seen in the area. During the 1980's number of seals was already growing, but in mid-1990's they became a real problem. After that losses to fishermen have been even growing. In some areas fishing has to stopped altogether and fishermen have search fishing areas elsewhere. There are also fishermen who have left the industry because of the seals. The problem occurs in the whole Kvarken area, but seals are more abundant in some places. A shallow water area in outer Kvarken archipelago Snipansgrund-Medelkalla is a core area for seals. In that area seal populations growth was first detected and there the seal are the most abundant even today.

It is not just the amount of seals that causes the problem. Seal's behaviour has changed also, which makes the situation even more difficult. Seals come today into inner archipelago and are not afraid of fishing boats, on the contrary, they recognise fishing boats' sounds and follow them, because they know it means food. This is not a natural[6] *behaviour of seals. Still in 1970's, when seals were hunted and had been hunted intensively for centuries, seals were afraid of humans. Fishermen had weapons with them and they shot seals whenever they were seen. Seals were a valuable resource at that time. Seals stayed in the outer archipelago and were very timid. At that time fishing took place in the inner archipelago. Then there were many times more seals than there are today, but seal damages were not a problem.*

[6] 'Naturalness' of seals' behaviour, actually seals' unnatural behaviour, is an aspect that brought up in many of the interviews by interviewees themselves.

Seals are so clever animals that they soon learn where they can easily find food. The easiest way for seals is to take fish from the fishing gear. They can easily swim in and out in a complex fishing gear like a trap-net. Adult grey seal is also a very strong animal. They can tear holes in trap-nets to get fish. A problem with strong seals is that even the fish that the seal did not take from the trap-net can escape through the holes.

The storyline consists of two sub-themes. Sub-themes are in a form of assertions:

- *Seals are the biggest problem to coastal fishery in Kvarken.* This assertion is describing the magnitude of the problem that the seals cause.
- *Seal's behaviour has changed.* Seals have expanded to areas where they have not been earlier. They are not afraid of humans anymore like they used to be.

3.2.2 Storyline 2: Reintroduced seal hunting

Seal hunting was started again in 1997 (see chapter 3.1.2.2.1). After that hunting volume has been gradually increased. In recent years hunting quota in the region has become that high that seal hunting can be practiced by quite many hunters. In this respect grey seal has become one of the game species in the area again. Discourse about seal hunting was very frequent even without a direct connection to seal damages.

In Kvarken area there is a very long seal hunting tradition. Kvarken was one of the most important seal hunting areas in Finland until 1970's. Earlier before the WWII and in late 19th century there were quite a few hunting bands here that spent several weeks on the ice in the springtime hunting seals. It was an important part of the local economy. Until early 1970's hunters were paid for killed seals. That money was substantial part of the hunters' household incomes. Seals became rare during 1970's and hunting lost its economic role.

In 1980's seal hunting was forbidden for conservation reasons until in late 1990's it was allowed again. At first the hunting quota was insignificant. Only in very recent years in early 2000's the quota has become so high that quite many hunters have an opportunity to shoot seals. This has been a very positive development. Now seal hunting is a real hobby in the area. Of course, there still are more potential hunters than hunting licences.

Hunting was not practiced for almost two decades. During that time a new generation of hunters has become active. There are still a few old seal hunters alive, who can tell about hunting trips and teach younger hunters. Young hunters have been willing to learn seal hunting. Kvarken Council's grey seal project organised seal hunting courses and courses of processing seal's skin, fat and meat. Some of the old seal products are available again. Old seal meals are cooked again in the hunters' households and there is quite strong demand for oil cooked from seal fat. It is a good raw material for traditional paints. Even though markets for seal products are developing it still is on a very small scale. Hunting is a hobby, not a source of income. It is quite expensive form of hunting, because one must have boats and high-quality equipment in seal hunting.

It is important that seals are utilised as a renewable natural resource. It is not acceptable that seals are just shot to reduce damages on fishing. People in the area do not accept it, but it is also

more acceptable for the general public, if they see that seals are used as a resource not just killed as pests.

Sub-themes in this storyline are:

- *Hunting should be utilisation of resource.* It is very important that seals are used as a resource. Just killing seals because they cause damages is not acceptable.
- *Hunting tradition is an important part of local culture.* This assertion is underlining the importance of old hunting tradition for the area. Reintroduced seal hunting is keeping the tradition alive.

3.2.3 Storyline 3: Seal conservation policy

Seal conservation policy was one of the important themes in the interviews. Talk about seal conservation is closely related to the hunting discourse. Regulation of hunting is more a resources management issue than a nature conservation issue as such, but in the interviews seal management policy was often presented as, or at least closely connected to, a nature conservation policy. The talk about seal conservation culminated especially in the talk about grey seal reserve that was designated in the area in 2001.

Seen from a top-down perspective designation of grey seal reserves and seal management policy in Finland are separate issues. The Ministry of the Environment had a central role in the designation of reserves, while seal management policy in general is implemented as a hunting regulation. The Ministry of the Environment have only a very small role in hunting management that is the duty of the Ministry of Agriculture and Forestry. The interviews mostly represent the views of local and regional level actors. In their talk about seal management and grey seal reserves these issues were often discussed together, especially in the local level interviews. Hunting management and the grey seal reserves are discussed together in one storyline.

Seal management policy has been very precautionary[7]*. It took long before fishermen's messages about seal damages were heart in the administration. The environmentalists and international policies are reasons for the precautionary policy. The environmentalists have a strong influence on seal management policy in Finland. Both national level environmentalists – WWF Finland and Finnish Association for Nature Conservation – as well as international groups like WWF and Coalition Clean Baltic are powerful groups. Finnish authorities are afraid of them. The environmentalists can get their voice heart especially via the Ministry of the Environment, but they influence also hunting authorities. On the international level the environmentalists influence nature conservation policies in the EU and HELCOM.*

Game management is general has always been too slow to react to changes in populations. The populations are let to grow too big. This leads to many kinds of problems. For instance, too big moose populations have caused serious damages to forestry and traffic, whereas foxes became susceptible to diseases after populations were let to grow too big. It is too late if management is changed only when populations are too big. It is the same thing with seals. Large population and uncontrolled growth lead to high damages on fishery and can even add a risk of seal epidemics. There have been serious epidemics in the North Sea. A proper management of game species

[7] The interviewees were **not** refering to a concept of 'precautionary approach' often used in environmental policy discourses.

requires population controlling. It is beneficial for the species it self as well as to human interests. Seal hunting could even be free – without quotas and licences. Hunting would make seals afraid of humans again, in other words would make them behave naturally. This can be achieved if seal hunting is intensive so that they learn they lesson.

One important aspect of management policies is the actual size of the population. Scientists count the number of seals every year, but their estimates are far too small. There are much more seals in the sea than scientists say. When they count seals from aeroplanes they can only see a small proportion of the seals, but still they only report the number of counted seals. The environmentalists underestimate the number of seals, too, and for obvious reasons – a higher number of seals would justify increased hunting quotas.

Designation of grey seal reserves in 2001 was a bad example of the seal conservation policy in Finland. The Ministry of the Environment designated the reserve in Snipansgrund-Medelkalla, in spite of strong resistant from Kvarken area. The environmentalists and an international pressure were important factors behind the designation. It shows how little authorities listen to local people. Even regional level authorities opposed the designation. When the reserve was designated seal populations were already too big. There was no need for the reserve. Fishing near the reserve is very difficult, because of the number of seals. That area was the best seal-hunting place in the whole Kvarken. Now seal hunting is much more difficult in the whole area especially during the open-water season.

The seal reserve has also ruined opportunities for eco-tourism. There was a strong demand for seal-safaris in Kvarken. Actually tourists still ask about them, but we cannot promise that they can see seals. Earlier, when tourists could be taken to Snipansgrund-Medelkalla during the summertime it was almost certain that seals are there. Now it is forbidden to visit the area. Tourism business has lost this opportunity and it is also a loss to fishermen, because tourism entrepreneurs use fishermen as guides in Kvarken. Some fishermen have tourism as one of their income sources. Today tourists are taken out to Kvarken archipelago to enjoy the nature or to fish, but seeing seals is less certain. If seals are seen it is an interesting asset to the product tourism business can offer.

Sub-themes in this storyline are:

- *Seal population should be controlled.* Seal populations are growing fast and this will bring troubles for humans and the seals. There is a need to control the population size in order to minimise damages that seals cause, but also because it will be good for the populations themselves.
- *Hunting should be free.* In order to make hunting an effective mitigation measure to reduce seal damages it should be free. Hunting should be so intensive that seals would become afraid of humans again. Too restricted hunting cannot have this effect.
- *Local people are not listened to enough.* In formulation of seal conservation policy and hunting regulations the authorities do not listen to local people. Often the policies are against local peoples' interests.
- *The national and international level environmental groups have a too much influence on the seal policies.* The environmental groups are powerful actors behind nature conservation policies. Finnish authorities, even hunting administration, are afraid of them.

- *The grey seal reserve is only harmful.* There was no need to designate a seal reserve in Kvarken. It has only caused troubles for fishermen and hunters as well as to tourism business.
- *There are many more seals in the sea than researchers say.* Scientists report only a counted number of seals, even though they can only count a small proportion of seals. In addition, the environmentalists always talk about a smaller number seals that there is.

3.2.4 Storyline 4: Kvarken Council's grey seal project

The last storyline concentrates on a collaboration of regional stakeholders to find solutions for the seal problem. It concentrates on a project called 'Gråsälen I Kvarken'. i.e. 'Grey seal in Kvarken' (see chapter 3.1.2.2.3). This storyline is not as prominent as the other ones. The other storylines are the main discourses there are about the relationship between seals and fishery in the interviews. The storyline about the Kvarken Council's grey seal project is interesting and relevant for conflict mitigation. In comparison to other three storylines the last one is more clearly constructed by the researcher. This storyline is not as consistent as the other and it does not 'stick out' from the discourses as directly as other storylines. This is particularly due to a fact that the interviewed fishermen did not talk that much about the whole project as the regional level actors, the most of whom were either involved in the project or well informed about its progress. The fishermen, however, knew something about the project, especially the training of seal hunters. They also knew about testing of 'seal-proof' fishing gear.

The Kvarken Council started the three-year long grey seal project in 2000 to bring regional stakeholders together to discuss about the problem between seal conservation and coastal fishing and to create solutions. It was an outcome of an on-going discussion between regional actors to do something about the escalating seal problem at that time. There was a need to bring different authorities together to discuss about the situation. The main actors behind the project were regional fisheries authorities, fisheries associations, game management authorities and environmental authorities on both side of the Gulf of Bothnia, i.e. in Finland and Sweden. The Kvarken Council was an appropriate forum for the project, since it has had many projects related to fishing and nature conservation.

The first goal was to get regional stakeholder to discuss about seals in Kvarken. The purpose was to achieve a common understanding about the grey seal as a resource and as a problem. This took, of course, a lot of time and in the beginning differences between the views were quite big. In the end a common understanding or actually a statement about seals in Kvarken was reached. It was, admittedly, a compromise between different views, but one can argue that the in the end the views were closer to each other.

The project wanted to see seals as a renewable natural resource in Kvarken, not only as a nuisance. This way of seeing seals is much more positive and help to change the attitudes towards seals. The project also started to collect information about seal hunting tradition. It organised seal hunting courses and promoted development of seal products. All these aspects emphasised the seal's status as a resource.

The third important activity in the project was to test and promote 'seal-proof' fishing gears. A couple of new types of trap-nets were tested in different parts of Kvarken. The purpose was to test

how well it reduces seal damages, how it adopts to different environments and how well it catches different species in during different seasons. The tests were conducted quite successfully and the results were promising.

Regional action plan that presented the regional way of seeing seals in Kvarken was published in autumn 2004. It also presented the regional plan of action that aims at sustainable management of seal populations in the region. Sustainability meaning that there are viable seal populations in balance with the human needs.

Sub-themes in this storyline are:

- *All stakeholders were included in the Kvarken project.* The project was able to include all stakeholders on an equal basis. All perspectives were given equal weight during the process and the results represent views of all regional stakeholders.
- *The Kvarken Council's grey seal project brought stakeholders closer together.* The project's first goal was achieved. Today the stakeholders in the region have much better relationships than before the project.
- *The Kvarken Council's projects concentrated on right issues.* All the practical issues that the project dealt with were relevant

3.3 Variation of opinions among stakeholder

This chapter compares the views and perceptions of the stakeholders. This chapter looks at how the interviewees see different storylines and mitigation measures. Aggregations of opinions on storylines and mitigations measures all also presented to find where the stakeholders agree or disagree. The third way of presenting results of the discourse analysis is concentrating on alignments between stakeholders.

3.3.1 Stakeholders views about storylines

Chapter 3.3.1 discusses the different positions to the storylines presented above. The storylines are consistent discourses presented in the interviews, but not all of the stakeholders share the views presented in the storylines. Below different opinions are presented in tables. Presentation is based on sub-themes. Using sub-themes instead of the whole storyline gives a possibility for more detailed presentation. First the tables for each stakeholder group are presented and summarising chapter (chapter 3.3.1.1) discusses the differences and similarities between the stakeholders.

There are two dimensions in the table. One deals with importance to conflict management and the other is about the frequency that the assertions or corresponding issues[8] were talked in the interviews. The importance for conflict management presents how the stakeholder group sees the assertion. This is assessed during the analysis on the basis of how closely the issue that the assertions talks about is connected to the conflict in the interviews.

[8] The assertions are mostly direct citations from interviews or modified from the talk in the interviews. Naturally they are in the original form only in one of the interviews and how the assertions are seen in interviews is the researchers interpretation.

There are five main stakeholder groups that can be identified in the interviews. The first one is *'fishermen'*. These are the coastal fishermen. The second group is *'hunters'*. All of the fishermen that were interviewed have hunted seals. Their talk about seal hunting is also used in presenting the views of 'hunters'. Game management authority is included in this group. Third group is called *'fishery organisations'*. It includes fishermen's organisations as well as fisheries authorities. *'Environmental interests'* is a name of the fourth group. This group consists of the environmentalists and environmental authorities. Also their views are quite close to each other. The last group is *'tourism entrepreneurs'*.

Storylines and sub-themes are summarised in 0.

Table 3.5: The storylines and their sub-themes

Storylines	Sub-themes
Story line 1: The grey seal problem	1a) *Seals are the biggest problem to coastal fishery in Kvarken.* This assertion is describing the problem that the seals cause.
	1b) *Seal's behaviour has changed.* Seals have expanded to areas where they have not been earlier. They are not afraid of humans anymore like they used to be.
Storyline 2: Reintroduced seal hunting	2a) *Hunting should be utilisation of resource.* It is very important that seals are used as a resource. Just killing seals because they cause damages is not acceptable.
	2b) *Hunting tradition is an important part of local culture.* This assertion is underlining the importance of old hunting tradition for the area. Reintroduced seal hunting is keeping the tradition alive.
Storyline 3: Seal conservation policy	3a) *Seal population should be controlled.* Seal populations are growing fast and this will bring troubles for humans and the seals. There is a need to control the population size in order to minimise damages that seals cause, but also because it will be good for the populations themselves. Any animal population that grows too much is susceptible to diseases.
	3b) *Hunting should be free.* In order to make hunting an effective mitigation measure to reduce seal damages it should be free. Hunting should be so intensive that seals would become afraid of humans again. Too restricted hunting cannot have this effect.
	3c) *Local people are not listened enough.* In formulation of seal conservation policy and hunting regulations the authorities do not listen to local people. Often the policies are against local peoples' interests.
	3d) *The national and international level environmental groups have a too much influence on the seal policies*. The environmental groups are powerful actors behind nature conservation policies. Finnish authorities, even hunting administration, are afraid of them.
	3e) *The grey seal reserve is only harmful.* There was no need to designate a seal reserve in Kvarken. It has only caused troubles for fishermen and hunters as well as to tourism business to a smaller extent.
	3f) *There are many more seals in the sea than researchers say.* Scientists report only a counted number of seals, even though they can only count a small proportion of seals. In addition, the environmentalists always talk about smaller number seals that there is.
Storyline 4: Kvarken Council's grey seal project	4a) *All stakeholders were included in the Kvarken project.* The project was able to include all stakeholders on an equal basis. All perspectives were given equal weight during the process and the results represent views of all regional stakeholders.
	4b) *The Kvarken Council's grey seal project brought stakeholders closer together.* The project's first goal was achieved. Today the stakeholders in the region have much better relationships than be-fore the project.
	4c) *The Kvarken Council's projects concentrated on right issues.* All the practical issues that the project dealt with were relevant

Table 3.6: Views of the stakeholder group 'fishermen' on the sub-themes

Frequency in the interviews \ Importance for conflict management	Low	Medium	High
High	**2b**		**1a**, **1b**
Medium		**2a**, **3a**, **3f**, 4c	**3b**, **3c**, **3d**, **3e**
Low			

Note that fishermen did not address assertions 4a and 4 b.

1a) *Seals are the biggest problem to coastal fishery in Kvarken.* This assertion is describing the problem that the seals cause.
1b) *Seal's behaviour has changed.* Seals have expanded to areas where they have not been earlier. They are not afraid of humans anymore like they used to be.
2a) *Hunting should be utilisation of resource.* It is very important that seals are used as a resource. Just killing seals because they cause damages is not acceptable.
2b) *Hunting tradition is an important part of local culture.* This assertion is underlining the importance of old hunting tradition for the area. Reintroduced seal hunting is keeping the tradition alive.
3a) *Seal population should be controlled.* Seal populations are growing fast and this will bring troubles for humans and the seals. There is a need to control the population size in order to minimise damages that seals cause, but also because it will be good for the populations themselves. Any animal population that grows too much is susceptible to diseases.
3b) *Hunting should be free.* In order to make hunting an effective mitigation measure to reduce seal damages it should be free. Hunting should be so intensive that seals would become afraid of humans again. Too restricted hunting cannot have this effect.
3c) *Local people are not listened to enough.* In formulation of seal conservation policy and hunting regulations the authorities do not listen to local people. Often the policies are against local peoples' interests.
3d) *The national and international level environmental groups have a too much influence on the seal policies*. The environmental groups are powerful actors behind nature conservation policies. Finnish authorities, even hunting administration, are afraid of them.
3e) *The grey seal reserve is only harmful.* There was no need to designate a seal reserve in Kvarken. It has only caused troubles for fishermen and hunters as well as to tourism business to a smaller extent.
3f) *There are many more seals in the sea than researchers say.* Scientists report only a counted number of seals, even though they can only count a small proportion of seals. In addition, the environmentalists always talk about smaller number seals that there is.
4a) *All stakeholders were included in the Kvarken project.* The project was able to include all stakeholders on an equal basis. All perspectives were given equal weight during the process and the results represent views of all regional stakeholders.
4b) *The Kvarken Council's grey seal project brought stakeholders closer together.* The project's first goal was achieved. Today the stakeholders in the region have much better relationships than be-fore the project.
4c) *The Kvarken Council's projects concentrated on right issues.* All the practical issues that the project dealt with were relevant

A sub-theme's position in the table indicates the stakeholders' views about the sub-theme in relation to the sub-theme's importance for conflict management and how frequently the sub-theme is referred to in the interviews. Sub-themes are marked with its symbol (e.g. 1a or 4b). Agreement or disagreement with the assertion presented in the sub-theme is indicated in different fonts: normal font is a neutral attitude, **bold** font means agreeing with the assertion and underlined text means disagreement.

Table 3.7: Views of the stakeholder group 'hunters' on the sub-themes

Frequency in the interviews \ Importance for conflict management	Low	Medium	High
High	**2b**	**2a**, **3a**, **3b**,	**1b**, **1a**
Medium	**3e**, **3f**	**3c**, **4c**	**3d**, **4b**
Low			**4a**

1a) *Seals are the biggest problem to coastal fishery in Kvarken.* This assertion is describing the problem that the seals cause.
1b) *Seal's behaviour has changed.* Seals have expanded to areas where they have not been earlier. They are not afraid of humans anymore like they used to be.
2a) *Hunting should be utilisation of resource.* It is very important that seals are used as a resource. Just killing seals because they cause damages is not acceptable.
2b) *Hunting tradition is an important part of local culture.* This assertion is underlining the importance of old hunting tradition for the area. Reintroduced seal hunting is keeping the tradition alive.
3a) *Seal population should be controlled.* Seal populations are growing fast and this will bring troubles for humans and the seals. There is a need to control the population size in order to minimise damages that seals cause, but also because it will be good for the populations themselves. Any animal population that grows too much is susceptible to diseases.
3b) *Hunting should be free.* In order to make hunting an effective mitigation measure to reduce seal damages it should be free. Hunting should be so intensive that seals would become afraid of humans again. Too restricted hunting cannot have this effect.
3c) *Local people are not listened to enough.* In formulation of seal conservation policy and hunting regulations the authorities do not listen to local people. Often the policies are against local peoples' interests.
3d) *The national and international level environmental groups have a too much influence on the seal policies*. The environmental groups are powerful actors behind nature conservation policies. Finnish authorities, even hunting administration, are afraid of them.
3e) *The grey seal reserve is only harmful.* There was no need to designate a seal reserve in Kvarken. It has only caused troubles for fishermen and hunters as well as to tourism business to a smaller extent.
3f) *There are many more seals in the sea than researchers say.* Scientists report only a counted number of seals, even though they can only count a small proportion of seals. In addition, the environmentalists always talk about smaller number seals that there is.
4a) *All stakeholders were included in the Kvarken project.* The project was able to include all stakeholders on an equal basis. All perspectives were given equal weight during the process and the results represent views of all regional stakeholders.
4b) *The Kvarken Council's grey seal project brought stakeholders closer together.* The project's first goal was achieved. Today the stakeholders in the region have much better relationships than be-fore the project.
4c) *The Kvarken Council's projects concentrated on right issues.* All the practical issues that the project dealt with were relevant

A sub-theme's position in the table indicates the stakeholders' views about the sub-theme in relation to the sub-theme's importance for conflict management and how frequently the sub-theme is referred to in the interviews. Sub-themes are marked with its symbol (e.g. 1a or 4b). Agreement or disagreement with the assertion presented in the sub-theme is indicated in different fonts: normal font is a neutral attitude, **bold** font means agreeing with the assertion and underlined text means disagreement.

Table 3.8: Views of the stakeholder group 'fishery organisations' on the sub-themes

Frequency in the interviews \ Importance for conflict management	Low	Medium	High
High		**2a**	**1a**, **1b**, **4b**
Medium	**2b**	**3a**, **3b**, **3c**, **3e**, **3d**, **3f**	**4a**, **4c**
Low			

1a) *Seals are the biggest problem to coastal fishery in Kvarken.* This assertion is describing the problem that the seals cause.
1b) *Seal's behaviour has changed.* Seals have expanded to areas where they have not been earlier. They are not afraid of humans anymore like they used to be.
2a) *Hunting should be utilisation of resource.* It is very important that seals are used as a resource. Just killing seals because they cause damages is not acceptable.
2b) *Hunting tradition is an important part of local culture.* This assertion is underlining the importance of old hunting tradition for the area. Reintroduced seal hunting is keeping the tradition alive.
3a) *Seal population should be controlled.* Seal populations are growing fast and this will bring troubles for humans and the seals. There is a need to control the population size in order to minimise damages that seals cause, but also because it will be good for the populations themselves. Any animal population that grows too much is susceptible to diseases.
3b) *Hunting should be free.* In order to make hunting an effective mitigation measure to reduce seal damages it should be free. Hunting should be so intensive that seals would become afraid of humans again. Too restricted hunting cannot have this effect.
3c) *Local people are not listened to enough.* In formulation of seal conservation policy and hunting regulations the authorities do not listen to local people. Often the policies are against local peoples' interests.
3d) *The national and international level environmental groups have a too much influence on the seal policies*. The environmental groups are powerful actors behind nature conservation policies. Finnish authorities, even hunting administration, are afraid of them.
3e) *The grey seal reserve is only harmful.* There was no need to designate a seal reserve in Kvarken. It has only caused troubles for fishermen and hunters as well as to tourism business to a smaller extent.
3f) *There are many more seals in the sea than researchers say.* Scientists report only a counted number of seals, even though they can only count a small proportion of seals. In addition, the environmentalists always talk about smaller number seals that there is.
4a) *All stakeholders were included in the Kvarken project.* The project was able to include all stakeholders on an equal basis. All perspectives were given equal weight during the process and the results represent views of all regional stakeholders.
4b) *The Kvarken Council's grey seal project brought stakeholders closer together.* The project's first goal was achieved. Today the stakeholders in the region have much better relationships than be-fore the project.
4c) *The Kvarken Council's projects concentrated on right issues.* All the practical issues that the project dealt with were relevant

A sub-theme's position in the table indicates the stakeholders' views about the sub-theme in relation to the sub-theme's importance for conflict management and how frequently the sub-theme is referred to in the interviews. Sub-themes are marked with its symbol (e.g. 1a or 4b). Agreement or disagreement with the assertion presented in the sub-theme is indicated in different fonts: normal font is a neutral attitude, **bold** font means agreeing with the assertion and <u>underlined</u> text means disagreement.

Table 3.9: Views of the stakeholder group 'environmental interests' on the sub-themes

Frequency in the interviews \ Importance for conflict management	Low	Medium	High
High	**2b**		**1b**
Medium		**3c,** 3f**,** 4a, **4b**, 4c	1a, **2a**, 3b, 3e
Low		3a	

This group did not address 3d.

1a) *Seals are the biggest problem to coastal fishery in Kvarken.* This assertion is describing the problem that the seals cause.
1b) *Seal's behaviour has changed.* Seals have expanded to areas where they have not been earlier. They are not afraid of humans anymore like they used to be.
2a) *Hunting should be utilisation of resource.* It is very important that seals are used as a resource. Just killing seals because they cause damages is not acceptable.
2b) *Hunting tradition is an important part of local culture.* This assertion is underlining the importance of old hunting tradition for the area. Reintroduced seal hunting is keeping the tradition alive.
3a) *Seal population should be controlled.* Seal populations are growing fast and this will bring troubles for humans and the seals. There is a need to control the population size in order to minimise damages that seals cause, but also because it will be good for the populations themselves. Any animal population that grows too much is susceptible to diseases.
3b) *Hunting should be free.* In order to make hunting an effective mitigation measure to reduce seal damages it should be free. Hunting should be so intensive that seals would become afraid of humans again. Too restricted hunting cannot have this effect.
3c) *Local people are not listened to enough.* In formulation of seal conservation policy and hunting regulations the authorities do not listen to local people. Often the policies are against local peoples' interests.
3d) *The national and international level environmental groups have a too much influence on the seal policies*. The environmental groups are powerful actors behind nature conservation policies. Finnish authorities, even hunting administration, are afraid of them.
3e) *The grey seal reserve is only harmful.* There was no need to designate a seal reserve in Kvarken. It has only caused troubles for fishermen and hunters as well as to tourism business to a smaller extent.
3f) *There are many more seals in the sea than researchers say.* Scientists report only a counted number of seals, even though they can only count a small proportion of seals. In addition, the environmentalists always talk about smaller number seals that there is.
4a) *All stakeholders were included in the Kvarken project.* The project was able to include all stakeholders on an equal basis. All perspectives were given equal weight during the process and the results represent views of all regional stakeholders.
4b) *The Kvarken Council's grey seal project brought stakeholders closer together.* The project's first goal was achieved. Today the stakeholders in the region have much better relationships than be-fore the project.
4c) *The Kvarken Council's projects concentrated on right issues.* All the practical issues that the project dealt with were relevant

A sub-theme's position in the table indicates the stakeholders' views about the sub-theme in relation to the sub-theme's importance for conflict management and how frequently the sub-theme is referred to in the interviews. Sub-themes are marked with its symbol (e.g. 1a or 4b). Agreement or disagreement with the assertion presented in the sub-theme is indicated in different fonts: normal font is a neutral attitude, **bold** font means agreeing with the assertion and underlined text means disagreement.

Table 3.10: Views of the stakeholder group 'tourism entrepreneurs' on the sub-themes

Frequency in the interviews \ Importance for conflict management	Low	Medium	High
High	**2b, 3e***	**1b**	
Medium		**2a**, **3c**, 1a, <u>3b</u>	
Low		3a	

Tourism entrepreneurs did not address 3d or any assertions about the Kvarken Council's grey seal project. One of the tourism entrepreneurs is also an active environmentalist. This person did talk about the project, but not in relation to seal tourism.

1a) *Seals are the biggest problem to coastal fishery in Kvarken.* This assertion is describing the problem that the seals cause.
1b) *Seal's behaviour has changed.* Seals have expanded to areas where they have not been earlier. They are not afraid of humans anymore like they used to be.
2a) *Hunting should be utilisation of resource.* It is very important that seals are used as a resource. Just killing seals because they cause damages is not acceptable.
2b) *Hunting tradition is an important part of local culture.* This assertion is underlining the importance of old hunting tradition for the area. Reintroduced seal hunting is keeping the tradition alive.
3a) *Seal population should be controlled.* Seal populations are growing fast and this will bring troubles for humans and the seals. There is a need to control the population size in order to minimise damages that seals cause, but also because it will be good for the populations themselves. Any animal population that grows too much is susceptible to diseases.
3b) *Hunting should be free.* In order to make hunting an effective mitigation measure to reduce seal damages it should be free. Hunting should be so intensive that seals would become afraid of humans again. Too restricted hunting cannot have this effect.
3c) *Local people are not listened enough.* In formulation of seal conservation policy and hunting regulations the authorities do not listen to local people. Often the policies are against local peoples' interests.
3d) *The national and international level environmental groups have a too much influence on the seal policies*. The environmental groups are powerful actors behind nature conservation policies. Finnish authorities, even hunting administration, are afraid of them.
3e) *The grey seal reserve is only harmful.* There was no need to designate a seal reserve in Kvarken. It has only caused troubles for fishermen and hunters as well as to tourism business to a smaller extent.
3f) *There are many more seals in the sea than researchers say.* Scientists report only a counted number of seals, even though they can only count a small proportion of seals. In addition, the environmentalists always talk about smaller number seals that there is.
4a) *All stakeholders were included in the Kvarken project.* The project was able to include all stakeholders on an equal basis. All perspectives were given equal weight during the process and the results represent views of all regional stakeholders.
4b) *The Kvarken Council's grey seal project brought stakeholders closer together.* The project's first goal was achieved. Today the stakeholders in the region have much better relationships than be-fore the project.
4c) *The Kvarken Council's projects concentrated on right issues.* All the practical issues that the project dealt with were relevant

*On this subject the interviewees disagreed. One of them was also an active environmentalist.

A sub-theme's position in the table indicates the stakeholders' views about the sub-theme in relation to the sub-theme's importance for conflict management and how frequently the sub-theme is referred to in the interviews. Sub-themes are marked with its symbol (e.g. 1a or 4b). Agreement or disagreement with the assertion presented in the sub-theme is indicated in different fonts: normal font is a neutral attitude, **bold** font means agreeing with the assertion and <u>underlined</u> text means disagreement.

3.3.1.1 Patterns in views about storylines and sub-themes

This chapter presents the main patterns in the above tables. Views about sub-themes are discussed first. The stakeholder groups' positions in relation to the storylines are presented in the end of the chapter.

For **fishermen** (0) it is clear that the seals are the biggest problem for the industry. They also talked a lot about seal's behaviour and how it has changed. Seal's behaviour is closely connected to the damages that they cause.

They feel strongly that their views are not listened to in the formulation of seal policies. Decision makers do not take into account the problems that the growing seal populations are causing to fishermen. According to the fishermen national and international level environmental groups have a strong influence on the policy and practices in Finland. Talk about the grey seal reserve is associated to fishermen's discourse about power relations in seal policies. There was a clear opinion that the grey seal reserve is harmful.

Fishermen see hunting as closely related to the conflict management. Hunting should be increased in order to make seal hunting an efficient mitigation measure. For fishermen, who mostly are also seal hunters, seal hunting has a value in itself. They also talked a lot about hunting tradition in the area. It is highly valued, but does not have importance in relation to the conflict.

There was one assertion that they disagree with. In their opinion the Kvarken Council's project should not have invested so much in testing of the 'seal-proof' fishing gear (see chapter 3.1.2.2.2). Most of the fishermen do not believe that these gears would bring solutions to the conflict. Even though fishermen were sceptical about these gears and the tests it did not seem to be such an important issues that it would become very critical in involving fishermen into conflict management.

The fishermen's opinions about the Kvarken Council's grey seal project were not just negative. The hunting training that the project organised was seen as a very valuable activity. Otherwise, the Kvarken Councils project was not very important in the fishermen's discourse. They did not, for instance, talk about the project's role in forming the relationship between stakeholders even though they preferred a collaborative approach conflict resolution. This indicates that the Kvarken Council's project as a whole did not incorporate fishermen very closely into its activities.

In the **hunters**' interviews (0) hunting had, of course, an important role. Hunters were especially happy about the hunting tradition's revival in Kvarken and they very strongly feel that hunting should aim at utilisation of seals as a resource. In other words, they emphasised the seal's status as a game animal. They would like to see hunting less restricted. These issues were not very closely related to the conflict, though, except in the interviews of the fishermen who are also hunters. Hunters also were worried, that too rapid growth of seal populations will bring more damages to fishermen and especially that seals may become susceptible to diseases. Therefore control of population is needed. Hunters emphasised that the environmentalists have a lot of power in decision-making, which is an important aspect also for conflict management. Hunters did agree that the seal problem is a difficult one for the fishermen.

Hunters were satisfied with training courses that the Kvarken Council's project organised.

They also found that it was good that the project had a collaborative approach since the seal question has been so difficult. Game management authority has been involved in the project and did not see that any groups were left out of the project. Other interviewees in this group did not talk about this aspect of the Kvarken Council's project.

Fisheries organisations (0) mostly agreed with the fishermen. They recognised the seal problem as the most difficult problem that the industry is facing. Similarly they connected the changed behaviour of seals with the damages.

Fisheries organisations' opinions about influential groups in policy-making corresponded with the views of the fishermen. Environmentalists have a lot of power, whereas local people, especially fishermen, have little influence.

The importance of hunting was not given as quite high role in the conflict management as the fishermen gave. Especially the fishery organisations did not support very liberal seal management. Controlling seal populations is an issue that is seen important and it is connected with the conflict management.

Fishery organisations were key actors in the Kvarken council's grey seal project. According to interviews, they saw that all relevant groups were represented during the project. They especially emphasised that bringing stakeholders together to discuss about the issue has brought different group's views closer to each other. They were also of opinion that the practical activities – testing of 'seal-proof' fishing gear and training of hunters were important for the conflict management.

The stakeholder group '**environmental interests**' (0) agreed that seals are a big problem for the fishermen, but in their interviews other problems were highlighted quite much, too. Regarding the conflict, the problem is however seen as a very important issue.

The environmental stakeholders want to keep hunting as strictly regulated. They did partly share the worry that a too big population may be susceptible to epidemics, but this theme is not very important in the interviews or for the conflict. The environmental stakeholders emphasised that hunting should aim at utilisation of seals. They were strong in their view against killing seals just to minimise the damages.

They had an opinion that local people have not influenced decision making a lot. Especially the fishery was seen so small a player that their interests can be sometimes overlooked in decision making. Interesting aspect is that the environmental stakeholder did not really talk about national and international level environmental groups influence on the seal conservation policies. From their perspective the environmentalists' activities do not seem to be very visible or strong.

The environmental stakeholders did mention that some of their suggestions were not incorporated into the Kvarken council's grey seal project. They felt also somewhat left outside the activities. Therefore, they disagreed with the assertions 4a and 4c. However, they did agree that the project managed to bring the stakeholders closer to each other and during the project communication between stakeholders has improved.

From the **tourism entrepreneurs'** point of view (0) many of the assertions do not seem to be relevant. They have very special and limited interest in the subject. They were well aware of

the problems that fishermen have with the seals, but they also emphasised the other difficult issues that the fishermen are facing. The conflict is not very central to the tourism business.

Tourism entrepreneurs would like to keep hunting fairly well restricted. Not because it would disturb nature tourism in any significant way. Tourism entrepreneurs that work in the field of nature tourism share many of the views of environmentalists. They did not oppose hunting altogether. In fact, from their perspective hunting tradition in the region is very valuable and it could be even connected with their own business.

Tourism entrepreneurs talked a lot about the seal reserve. One of them felt that the reserve is very harmful for the business, because restrictions on the use the area has taken away the best location for organising seal-safaris. In fact, it is the only area where seeing seals can be guaranteed to customers. However, the other tourism entrepreneur who was also an active environmentalist did not have as negative opinion about the reserve. Neither of the tourism entrepreneurs connected the reserve to the conflict very closely.

When different stakeholder groups' views are compared it can be seen that the groups 'fishermen', 'hunters' and 'fishery organisations' are very close to each other. There are some differences between them. The group 'environmental interests' disagree on quite many issues with the three groups. The disagreement is not, however, very deep and these groups agree on some of the important issues, as well. From the tourism business perspective many of the sub-themes are irrelevant. The group has very special and limited relationship to the model conflict.

The storylines related to the conflict between seal conservation and coastal fishing that are clearly identifiable in the interviews represent closest the fishermen's and hunters perspectives. The conflict seems to be essentially a fishermen's conflict. They are the party that is suffering – together with seals, of course. The environmentalists and environmental authorities who are the spokespersons of seals in a human society do not obviously feel that seals are suffering in the same way as fishermen. They see that seal populations are growing and relatively healthy, so suffering of the individual seals as a result of hunting or entanglement in fishing gear is not considered to be very serious. Seal hunting has not been opposed totally by any stakeholders, except when the seal hunting was first started again in 1997. Another possible explanation why the conflict is seen as the fishermen's conflict is that it was the fishermen and their representatives who were the first to raise the conflict into public awareness and discussions among regional stakeholders. Their central role in giving the form and content to the conflict has not been seriously challenged.

Naturally this research project's focus on the conflict, and especially in the discourse analysis that is deliberately a local level study of the model conflict, has influenced which storylines are interpreted as important. For instance, one storyline in the interviews was changes in Kvarken region's fish stocks, but it has only remote and indirect connection to the conflict. Therefore it has not been brought up in the report.

The stakeholder groups' views about sub-themes in relation to their importance for conflict management are closer to the high importance end of the continuum. Storylines and sub-themes that are relevant to the conflict are brought up in the analysis. However, it is interesting that the analysis of the interviews shows that stakeholder groups, except tourism entrepreneurs, do not disagree very much about which issues are relevant for conflict management. This indicates that an overall understanding of what the conflict is about is quite

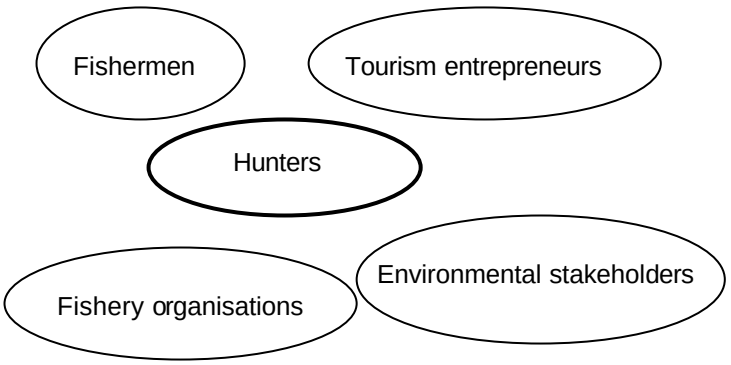
well shared in the region. This can be stemming from at least two issues. First, the Kvarken Council's grey seal project's clear aim was to build a regional understanding of the conflict. This goal has been reached quite well. Even if the fishermen were not very closely involved in the project, their views were incorporated since regional fishermen's organisation and fisheries authority had central roles in the project. Second, a long discussion on the regional media about the problems and fishermen's prominent role in that discussion has influenced how the conflict has become to perceived in the area, especially in a situation where stakes for one interest group seem to be much higher than for other groups.

3.3.1.2 Alignments by storylines

Similarities and differences in the stakeholder groups' views about storylines can be presented in a graphical form that describes the groups alignments in relation to the storylines.

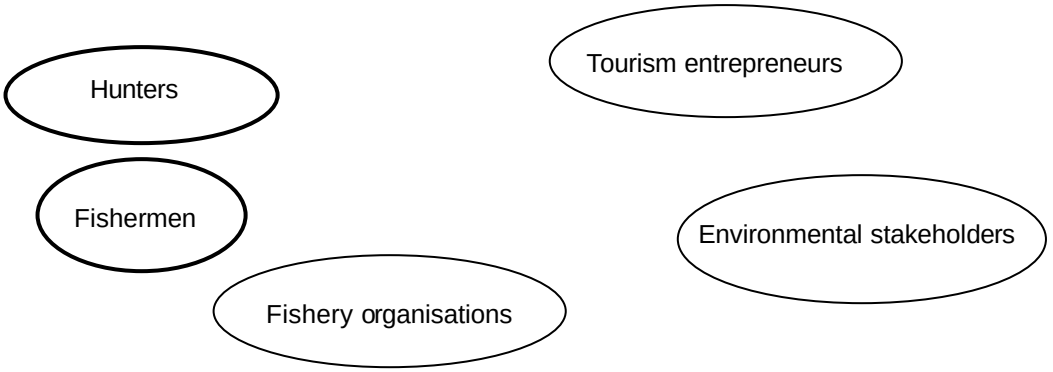
Storyline 1: The grey seal problem
Fishermen, fishery organisations and hunters share the views presented in the storyline 1, but it can be seen mostly as the fishermen's storyline. Environmental stakeholders partly share it, but there are some issues that they do not agree with. Tourism entrepreneurs do agree with some of the issues presented in the storyline 1, but many of the aspects are irrelevant for them. Fishermen are in the centre of the storyline.

Storyline 2: Reintroduced seal hunting
Hunters are in the centre in relation to this storyline. All groups agree with it and it is relevant even for the tourism entrepreneurs.

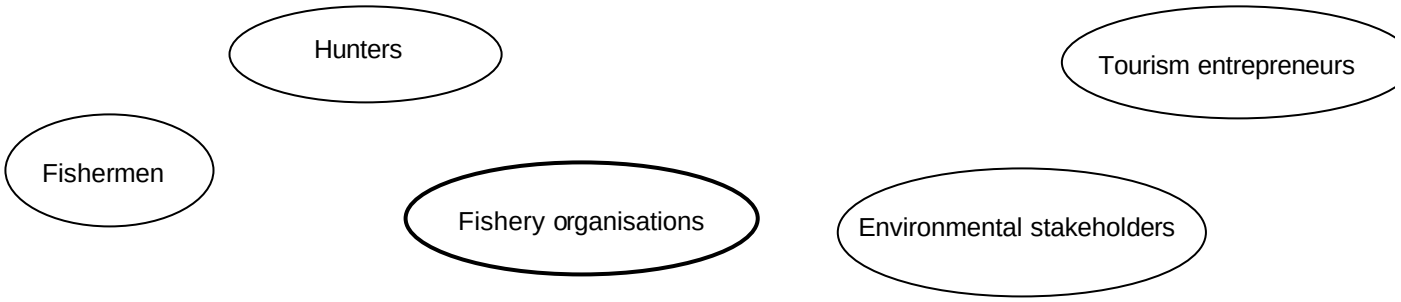


Storyline 3: Seal conservation policy

Fishermen, fishery organisations and hunters share the views presented in the storyline 1. The most important it is for the fishermen and hunters. Environmental stakeholders share it only partly. They clearly disagree with some aspects of the storyline. Tourism entrepreneurs do agree with some of the issues, especially about the grey seal reserve. Many of the aspects are irrelevant for them. Hunters and fishermen are the core groups.



Storyline 4: Kvarken Council's grey seal project
Fisher organisation and environmental stakeholders are closest to the storyline, because they represent the views of the organisations involved in the Kvarken project, although the environmentalists felt that some of their views were neglected in the project. Fishermen are far from it, since they do nor appreciate some of the activities done in the project as well as because they were not very closely involved with the project. Hunters are, in fact, divided to those who were closely involved and those who were not. For tourism entrepreneurs the project was not relevant although they would have like to see nature tourism discussed in it. Fishery organisations is the core group in this storyline.



3.3.2 Views about mitigation measures

The mitigation measures available in the Finnish case are presented in the chapter 3.1.2.2. The mitigation measures are: hunting of seals, designation of grey seals reserves, compensation on damages to catch in 2000 and 2001, fishery insurance, testing and promoting seal-proof fishing gear, creation of a stakeholder forum during the Kvarken Council's grey seal project, training of seal hunters and changing fishing methods. The following tables describe different stakeholders views about the mitigation measures. For a similar kind of graphical presentation the mitigations have been translated into assertions about their effectiveness. This way they can be located in the tables to describe stakeholders' opinions about the mitigation measures. Fishery insurance was not discussed in the interviews, except in the interview of a person who works in the regional fishery insurance association (see chapter 3.1.2.2.2.). Fishery insurance is thus not one of the mitigation measures discussed in the following table.

The stakeholder groups are the same as above except the tourism entrepreneurs, which are not included in the following discussion. From they point of view only seals reserve is relevant. Easing the restrictions on the use of the reserve would enhance their business opportunities.

Table 3.11: Views of the stakeholder group 'fishermen' about mitigation measures

Frequency in the interviews \ Importance for conflict management	Low	Medium	High
High			**1***
Medium	**6**		**2**, **3**, <u>4</u>
Low		**5**, **7**	

1. Seal hunting is an effective measure
2. The grey seal reserve is only harmful
3. Seal damages should be compensated
4. Seal-proof fishing gear can reduce damages
5. Collaboration between stakeholders is valuable, e.g. in style it was done in the Kvarken Council's project
6. Training of seal hunters was useful
7. Change of fishing method can reduce damages

*This was a majority view, but not unanimous one.

An assertion's position in the table indicates the stakeholders' views about it in relation to the mitigation measure's importance for conflict management and how frequently it is referred to in the interviews. Assertions are marked with their symbols (e.g. 1a or 4b). Agreement or disagreement with the assertion is indicated in different fonts: normal font is a neutral attitude, **bold** font means agreeing with the assertion and <u>underlined</u> text means disagreement.

Table 3.12: Views of the stakeholder group 'hunters' about mitigation measures

Frequency in the interviews \ Importance for conflict management	Low	Medium	High
High	**6**	**1**	
Medium		**2**	**3**, **5**
Low		**7**	**4**

1. Seal hunting is an effective measure
2. The grey seal reserve is only harmful
3. Seal damages should be compensated
4. Seal-proof fishing gear can reduce damages
5. Collaboration between stakeholders is valuable, e.g. in style it was done in the Kvarken Council's project
6. Training of seal hunters was useful
7. Change of fishing method can reduce damages

An assertion's position in the table indicates the stakeholders' views about it in relation to the mitigation measure's importance for conflict management and how frequently it is referred to in the interviews. Assertions are marked with their symbols (e.g. 1a or 4b). Agreement or disagreement with the assertion is indicated in different fonts: normal font is a neutral attitude, **bold** font means agreeing with the assertion and <u>underlined</u> text means disagreement.

Table 3.13: Views of the stakeholder group 'fishery organisations' about mitigation measures

Frequency in the interviews \ Importance for conflict management	Low	Medium	High
High		**5**	
Medium	**6**	**1**, **7**	**2**, **3**, **4**
Low			

1. Seal hunting is an effective measure
2. The grey seal reserve is only harmful
3. Seal damages should be compensated
4. Seal-proof fishing gear can reduce damages
5. Collaboration between stakeholders is valuable, e.g. in style it was done in the Kvarken Council's project
6. Training of seal hunters was useful
7. Change of fishing method can reduce damages

An assertion's position in the table indicates the stakeholders' views about it in relation to the mitigation measure's importance for conflict management and how frequently it is referred to in the interviews. Assertions are marked with their symbols (e.g. 1a or 4b). Agreement or disagreement with the assertion is indicated in different fonts: normal font is a neutral attitude, **bold** font means agreeing with the assertion and <u>underlined</u> text means disagreement.

Table 3.14Views of the stakeholder group 'environmental interests' about mitigation measures

Frequency in the interviews \ Importance for conflict management	Low	Medium	High
High			1
Medium	7	**4**, **6**	<u>2</u>, **3**, **5**
Low			

1. Seal hunting is an effective measure
2. The grey seal reserve is only harmful
3. Seal damages should be compensated
4. Seal-proof fishing gear can reduce damages
5. Collaboration between stakeholders is valuable, e.g. in style it was done in the Kvarken Council's project
6. Training of seal hunters was useful
7. Change of fishing method can reduce damages

An assertion's position in the table indicates the stakeholders' views about it in relation to the mitigation measure's importance for conflict management and how frequently it is referred to in the interviews. Assertions are marked with their symbols (e.g. 1a or 4b). Agreement or disagreement with the assertion is indicated in different fonts: normal font is a neutral attitude, **bold** font means agreeing with the assertion and <u>underlined</u> text means disagreement.

3.3.2.1 The patterns in stakeholder groups' views about mitigation measures

Fishermen talked quite a lot about seal hunting. The interviewed fishermen are seal hunters, which influences this, but their talk about hunting was often connected to seal damages and ways of reducing them. Seal hunting was seen as the most effective mitigation measure. None of them thought that hunting would very easily solve the problem, though. In fact, one of the interviewed fishermen did not believe that hunting would really minimise damages, because there are so many seals. The main mechanism by which seal hunting would bring effects is that a continuous and intensive hunting will make seals afraid of humans again.

There were two other mitigation measures that were equally important for conflict management in the fishermen's interviews. Compensation of damages to catch was one of them. Fishermen agreed very strongly that damages should be compensated and they were not satisfied with the compensations that were paid. According to interviewed fishermen, the compensations should not be a permanent arrangement and a primary mitigation measure. They argued that compensations are needed now when there are no other effective solutions available. In the long run they do not want that their living is based on state aid or welfare.

Another important issue is the grey seal reserve. Even though the reserve itself is not, according to all interviewed fishermen, a very important issue in relation to the damages, the fishermen still are bitter about the designation process. Because it still affects fishermen's perception about environmental authorities the grey seal reserve is an issue that has to be discussed also in the future.

Fishermen know that there are many actors who believe in seal-proof fishing gear and they are aware of the regional fisheries authority's and fishermen's organisations interest in such gears. Fishermen themselves do not really believe that these gears could solve the problem. Although, fishermen themselves do not think that these gear are a solution to the problem, the controversy about these mitigation measures makes them important for the conflict management.

The fishermen see that collaborative approach to solve this kind of complex problems is needed. They did not really mention the stakeholder forum in the Kvarken Council's project as such an approach unless it was brought up by the interviewer. Fishermen did not really find the project as their own – it was regional level actors' project. What they found useful in the project was the hunting training.

Hunters talked naturally about seal hunting. They were well aware that reducing damages to coastal fishing is the main reason that hunting was stated again. They agree with assertion saying that seal hunting can reduce damages, but seal hunting clearly has a value on its own for hunters. Similarly, when they talked about the grey seal reserve in Kvarken they mostly saw it as a problem for seal hunting, not directly related to the conflict.

One of the interviewed persons here counted as a member of the stakeholder group 'hunters' was a game manager. He was personally involved in the Kvarken Council's grey seal project. He, especially, saw that the stakeholder forum in the project had improved communication between the stakeholders in the region. Improved communication is important for the conflict management. He as well as others in the group 'hunters' emphasised the importance of seal hunting training, but it was not much connected to the conflict.

The main actors behind the Kvarken Council's grey seal project belong to the stakeholder

'fishery organisations'. They had experienced that the project was valuable in bringing stakeholders closer together. They were the ones who organised testing of the seal-proof fishing gear. They have rather positive view about the possibilities of the gear, although they do not think that it would be the sole solution of the problem. Seal hunting is needed as well. They felt strongly that compensations are needed and compared to the fishermen they did not that much emphasise the low preference of state aid among the fishermen. They were aware of this, though.

The controversy about the designation of seal reserves was strongly felt among this group. After all, they were the main actors resisting it during the designation process.

The group **'environmental interests'** has rather neutral opinion about the assertion 'seal hunting is an effective measure'. Some of the interviewees in this group would agree with it, but some of them didn't really believe that it would make a big difference. They agreed the hunting would make seals more afraid of humans, but this does not necessarily mean that seal will left fishing gear alone – they would just escape when a fishing boat is arriving and then come right back. In fact, one of the fishermen said exactly the same. According to these interviewees, seal-proof fishing gear and compensations would be preferred mitigation measures to hunting.

The regional environmental administration was involved in the Kvarken Council's project, but they did not have as central role as the fisheries sector organisations. The projects focus was not exactly what they would have preferred. In spite of this, they felt that communication between stakeholders has improved because of the stakeholder forum created in the project. For them training of seal hunters is important, since skilled hunters can hunt in more ethical way. Trained hunters would cause less pain and they will not kill ringed seals accidentally.

This group did not agree with assertion saying that seal reserve is harmful. During the designation process even they had actually felt that there is no need for the reserve. Later when hunting quota has increased every year they have realised that seal reserve may be the only peaceful place for seal in the region and their opinion about seal reserves have changed.

3.3.3 Aggregation of opinions

This chapter summarises the stakeholder groups' views about the storylines and mitigation measures. The summary is presented similarly in a table like the stakeholders' views about the storylines and mitigation measures. The main difference in the 0 to previous tables is that importance for conflict management is here the researchers assessment. Especially the controversial issues and views about mitigation measures are seen as being important for conflict management.

Table 3.15: Aggregation of opinions on storylines and mitigation measures

Frequency in the interviews \ Importance for conflict management	Low	Medium	High
High	**2b**	**4b**	1a, **1b**, 3b
Medium	4c, **M6**	**2a**, **3a**, **3c,** 3d, 3f, 4a	3e, M1, **M3**, M4, **M5**
Low		**M7**	

1a) *Seals are the biggest problem to coastal fishery in Kvarken.*
1b) *Seal's behaviour has changed.*
2a) *Hunting should be utilisation of resource.*
2b) *Hunting tradition is an important part of local culture.*
3a) *Seal population should be controlled.*
3b) *Hunting should be free.*
3c) *Local people are not listened enough.*
3d) *The national and international level environmental groups have a too much influence on the seal policies*.
3e) *The grey seal reserve is only harmful.*
3f) *There are many more seals in the sea than researchers say.*
4a) *All stakeholders were included in the Kvarken project.*
4b) *The Kvarken Council's grey seal project brought stakeholders closer together.*
4c) *The Kvarken Council's projects concentrated on right issues.*
M1. *Seal hunting is an effective measure*
M3. *Seal damages should be compensated*
M4. *Seal-proof fishing gear can reduce damages*
M5. *Collaboration between stakeholders is valuable*
M6. *Training of seal hunters was useful*
M7. *Change of fishing method can reduce damages*

A sub-theme's and mitigation measure's position in the table indicates their importance for conflict management and how frequently they are referred to in the interviews. Agreement or disagreement **between the stakeholder groups** about the assertions is indicated in different fonts: normal font is a neutral, **bold** font means agreement and underlined indicates that the stakeholders disagree about the assertion.

3.3.3.1 The patterns in the synthesis table

One pattern in the tables above is very clear. The fishermen, fishery organisations and even hunters have mostly the similar ways of seeing the sub-themes. They agree that seals are causing serious problems (1a) and that this issue is important for conflict management. These groups (like all stakeholder groups) seem to share the view that seal's behaviour has changed (1b), which is connected to the amount of damages.

They also share the basic opinion about hunting: it is good that hunting is allowed again and restrictions on it could be looser than they are today (3b). Hunting is, however, more important issue for the hunters than the other two groups. Fishermen are seeing hunting as more important to conflict management than other groups, but they all see it as rather important in this respect.

Seal's being the most serious problem for coastal fishery is a controversial issue since some of the stakeholders agree so strongly with it and others do not see it as serious. None of the stakeholders denies that seals are causing problems. Stakeholders' views about one of the mitigation measures – M1 – is controversial in a similar way. Some stakeholders agree with it completely while other have much less confidence in the assertion. The restrictions on seal hunting (3b) are truly a controversial issue. The environmental stakeholders, even though they see that the quota will still rise in the future, would like too see hunting quite strictly regulated. In fact, even fisheries organisations do not seem to support loosening hunting restrictions very much. All stakeholders agree that controlling of seal populations (3a) is probably needed and useful. Others see this as a population health question, while others attach the reduction of damages quite closely with population control. All agree with the assertion saying that seal hunting should be utilisation of a resource (2a). It is seen as an ethical question – killing seals just to reduce damages to fishing is not acceptable. Utilisation of seals is also related to keeping the seal hunting tradition alive in the area.

Compensating seal damages (M3) is approved by all stakeholders and some of them, in fact, emphasise its importance. Even though the fishermen would not like to have their household economy being based on state aid or welfare, this assertion is not seen as controversial in relation to conflict management. Also the fishermen agree that compensations are needed now when other effective mitigation measures are not available.

Opinions about seal-proof fishing gears (M4) are controversial. Fishermen feel strongly against them while fisheries organisations and environmentalists have more positive view about them. This issue is also important for conflict management because the projects on testing and promoting fishing gear are continuing. There will be public funds available for investments in these gears, which guarantees that the issue will be discussed in the future. This discussion may reflect to conflict management, especially if fishermen's opinion about these gears will stay sceptical.

The grey seal reserve (3e) may also become a difficult issue in the future. Fishermen, hunters and fisheries sector representatives as well as tourism entrepreneurs are seeing the reserve negatively, whereas the environmental stakeholders have began to see some value in it. This issue must be dealt with in any future activities related to seal-fishery conflict.

3.4 Conclusions

The results of discourse analysis are presented in the chapters 3.2 in the form of storylines and in chapter 3.3 where stakeholder groups' views about storylines and mitigation measures are presented. The chapter 3.3.3.1 summarises that discussion.

The damages that seals cause to fishery have been rather severe already almost a decade. There have been a lot of discussions – occasionally even debates – and practical activities related to the problem. The conflict between conservation of grey seals and coastal fishery is quite clearly framed in the model region. The views about the conflict itself are not very different between the stakeholder groups and they also seem to agree on many of the details. It can be argued that the conflict there is, is not so much between stakeholder groups, but rather a one caused by side effects of a (successful) grey seal conservation policy. There is a quite good co-operation between regional level actors. The local level views are represented in, although not completely incorporated into, these regional activities. Therefore, the conflict management task is rather to improve already progressed processes, not to start from very beginning.

There are already existing mitigation measures. Unfortunately, none of them is very effective, but, on the other, hand new measures are being developed and old are improved.

3.4.1 Where would further knowledge be helpful

Better understanding the nuances would be important. Especially about the fishermen's and individual hunter's position in the historical development of the regions activities around the seal issue.

3.4.2 Implications for RAP

The region's actors have already produced a regional action plan (RAP) to deal with the conflict. Further activities should be targeted at improving the already existing RAP.

Kvarken Council's grey seal project is the key development in the area. During its course the seal issue was framed into certain kind of discourse. This discourse will be an important one also in the near future. The project is continuing in another three-year project. There is no need to develop new stakeholder forums or activities that are separated from the on-going ones. In fact, it would only be counterproductive for conflict management.

The on-going activities can be improved. The discourse analysis has shown some potential improvements.

1. There seems to be a need to incorporate some new stakeholders. New groups would be tourism business that has a clear interest in the seals and national level authorities: environmental authorities, fisheries authorities and game management authorities. Incorporating the national level actor's would help to seek support for regional level activities as well as to development of mitigation measures.
2. There is also a need to improve the weight of some of the stakeholder groups that are already involved. Environmentalists and environmental authorities felt that their views were not completely included in the Kvarken Council's grey project.

The interviews also revealed that the grey seal reserve is an issue to be discussed in the future. It has became almost like an obligatory passage point, a thing that cannot be passed (see e.g.

Latour 1999), in relation to the interaction between seals conservation and coastal fishing in the region.

3.4.3 Possible lessons that can be generalized to other cases

A good case emphasising the value of collaboration. Stakeholders has become closer to each other and communication is better now than it was before the Kvarken Council's project. Inevitably collaboration frames the way the issue is handled leaving some perspectives to lesser attention, while some other become dominant. This has happened in the Kvarken Council's project. However, situations are always dynamic and develop further. Changing the course of actions is possible, but may demand a lot of effort. The Kvarken case interviews show that the regional approach is fairly open.

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4 GERMANY

4.1 Introduction

This Discourse Analyses has been carried out in the context of the research with the EU-co-financed project FRAP, which aims at developing a generic Framework for biodiversity Reconciliation Action Plans. This report is part of the first phase of the project, which is dedicated to the description and analysis of the situations in the six different model regions spread out in Europe. The presented analysis of the discourses on the past and current state and possible developments and actions in the future aims to show how the different stakeholders talk and argue on the topic of biodiversity and fisheries.

To contextualize and focus this report we give a short overview of the whole work done in the project. In the first phase the work is divided into five work packages, two of them dealing with natural sciences, three of them with socio-economics. The three socio-economic work packages follow different approaches with respect to discipline and scale.

- The legally-oriented work focuses on the national and federal state level, due to the fact that relevant legislation is given at these levels.
- The economic work focuses on the level of the model region and compares the situation there with the national and state level.
- The sociological work, part of which is presented in this report, focuses on the model region and the local level.

In the second phase of the project this analysis should lead to the development of solutions in terms of policy instruments and of participatory approaches to possible conflicts between the conservation of biodiversity and the use of biological resources. The third phase should result in a synthesis of the outcomes of the six model regions and disseminate this result to the relevant stakeholders.

Since many project reports ("deliverables") are already available this report builds upon that knowledge, keeps the general information about the model region low and only adds the points which are essential to understand the research work presented here[9].

4.1.1 Historical description of the conflict

4.1.1.1 Description of the research sites "Teichlausitz" und "Hügelland"

As already mentioned in the introduction the FRAP model region on Germany is mainly equivalent to Upper Lusatia (Oberlausitz). This is the Eastern part of the German federal state of Saxony (Sachsen) and borders to Poland in the East, the Czech Republic in the South, the German state of Brandenburg in the North and the Saxonian capital Dresden in the West. The reasons to choose this area were

- the abundance of otters (*lutra lutra*),
- the existence of large-scale pond farming of carps (*cyprinus carpio*) of economic, social, and cultural relevance for the area
- the relatively small distance to the UFZ headquarters in Leipzig.

In the discussions with our colleges from the ecological discipline and during a preparatory field trip in August 2002 we learnt that also the case of the cormorant (*phalacrocorax carbo sinensis*) is relevant in the area, perhaps even more conflicting than the otter, and that the

[9] (Thum et al., 2003), (Usbeck et al., 2003), (Schwerdtner and Ring, 2004), (Zwirner and Wittmer, 2003)

situation in the Southern part of East Saxony near the Czech border is different to the area with the large-scale professional pond farming dominated by small business or hobby producers and anglers who both claim to be affected by otters. So two extensions were made:

- ?? to include the cormorant as a model species
- ?? to include the anglers and small business and hobby pond farmers in the South of Saxony

This led to define two research areas in the model region: the Upper Lusatian Pond Area (Teichlausitz) and the Upper Lusatian Hill Country (Lausitzer Hügelland). In the following two sections both research areas are discussed in their similarities and differences.

4.1.1.2 Fisheries in the model region

The main fishing activities are aquaculture in artificial ponds and angling. Catch fisheries and aquaculture in lakes or rivers are negligible. Typical farms are rather large with several ponds with a total area of up to several hundred hectares. This kind of fish farms has a century long tradition in the region. As the soils are poor, additional sources for food were welcome, so the swamps were converted to ponds. Until 1945 they were in most cases part of the big agricultural farms owned by nobles, then these nobles were expropriated and during the 1950ies the state leased the fish farms. In the beginning of the 1960ies the fish farms were transferred into state owned firms. During GDR times people working on the ponds only earned around 1,500 Marks of the GDR so they had not been able to save enough money to buy the ponds when this chance arose after the political change in the years 1989 and 1990 when the GDR state-owned ponds became property of the FRG and were offered for sale. It was a unique window of opportunity to buy the ponds after the end of the GDR, because the expropriation was done by the soviet military administration and not by the GDR. This is important, since land expropriated by the GDR had to be given back to the former owners, while the land (or ponds) expropriated by the military administration became property of the FRG and was then offered for sale. As the aquaculture professionals did not have the money and banks were not willing to finance mortgages the Saxon state bought ponds or financed the purchase of ponds by an association to conserve the cultural and nature heritage of Saxony. As a consequence of this development most fish farmers are tenants.

The pond areas are a semi-natural landscape with rich habitats for birds, amphibians and otters. Many of them are nature reserves or sites under the EU Habitat Directive. This kind of large pond farms are situated in the Upper Lusatian Pond Area (Teichlausitz).

Carp makes up about 90% of the fish production in these rather shallow ponds of about 1 m depth in average. It takes three years until the carp has the traditional Saxonian weight for sale of 3 ½ (metric) pounds. So the carps stay in the ponds for two winters and three summers. As the region is influenced by continental climate the temperatures during the winter can fall below zero degrees Celsius for extended periods. So the ponds become ice covered and the access for fish eating vertebrates like otters and cormorants is partly or totally blocked. They then feed in streams and rivers.

To fish the carps the ponds are emptied from water and so the carps concentrate in a small deeper area near the runoff the so called fish-pit *(Fischgrube)*, where they are removed from the pond with nets. This takes place in autumn. Carps are caught and mainly sold alive. The selling season is the winter until early spring. Therefore the fish is transferred to and stored in small basins normally made of concrete which are located on the premises of the fish farms for easy access during the selling period.

There are nearly 100 carp producers in the administrative region of Dresden which includes the model region. Most of the firms are in the model region. For around 40% aquaculture is the principal occupation and for the others aquaculture is a secondary occupation. Principal occupation businesses account for 94% of carp production. The total number of ponds (including a small number of ponds for angling and nature conservation) is 71; their area is around 5,000 hectares.

Besides the large pond farms there are also small hobby producers of carp which normally manage only one or a couple of small ponds. These ponds are mainly located in the Upper Lusatian Hill Country (Lausitzer Hügelland). In this second research area are also some producers of trout.

There are around 15,000 organized anglers in the administrative region of Dresden. Nearly all anglers are members of one of the 180 local angling associations. They are all members of the regional angling association who is covering the area of the administrative region of Dresden. The exact number of anglers in the model region was not estimated due to lack of information.

The angling waters are normally not owned by the angling associations. The standard approach is that the regional angling association is tenant of the angling waters and stocks the fish. The local angling associations are responsible for the day-to-day management of the angling waters. Also some aquaculturists and some conservation associations who manage ponds sell angling permissions. Around 5,000 hectares of standing and 1,325 km of streaming angling waters are in use.

4.1.1.3 Fish-eating vertebrates in the model region

The otter is present throughout the entire model region. The population is expanding and in consequence the area where otters occur is expanding to the West. The Eastern part of Saxony has been a hideaway for the otter during the 20th century. There are limited scientific means to investigate the exact numbers of an otter population. The official estimation is at least between the margins of 100 up to 400 specimens living in Saxony as a whole (Klenke and Zöphel, 1996). As fisheries in the model region has a long tradition there is also a long tradition of dealing with the otter as an animal that diminishes the gain from aquaculture. As the otter became a highly endangered species hunting was banned and strict protection was established already during GDR times.

On the contrast the cormorant is relatively new to the model region. Some of the interviewees reported that they saw their first cormorant in Lusatia during the 1970ies or '80ies. Throughout the 1990ies the number of cormorants migrating through and resting in the administrative region of Dresden nearly quintupled from 2,000 up to 10,000 specimens. (Seiche 2004). The negative impact on aquaculture became significant as they use the ponds as a food resource. As the cormorants are protected by European law possibilities for mitigation are limited. As the damages due to the cormorants are quite significant and might - the according to interviewees - endanger the economic survival of the pond aquaculture, the Saxon state established a financial compensation scheme.

4.1.1.4 Conservation in the model region

During GDR times environmental protection was not easy as persons concerned about environmental issues were suspected as critics of the socialist government. Nature protection

and observing animals was not that critical and organised within the Union for Culture *(Kulturbund)*. There was a wide-spread network of honorary nature protection delegates who were responsible for protected areas or a species in an administrative district (e.g. for the otter). This system is still alive in Saxony although its importance is diminishing as now nature conservation and environmental protection association are allowed and many of the former honorary conservation delegates became employees of the newly founded environmental offices at the district and regional level (see also storyline 4.1.3.11 We in Saxony Resolve Conflicts Cooperatively (RCC), p. 105). Due to this strong organisational basis of nature conservation the chances for advancements had been extraordinary during the phase of political changes in GDR 1989/90 and in the first half of the 1990ies after the reunification of the two German states. Nowadays the economic or agricultural interests are also well organised and so get more and more difficult to negotiate the conservation interests, e.g. staff in environmental offices decreases.

4.1.1.5 General information about the stakeholders

This discourse analysis is based on 26 interviews with 31 persons who represent stakeholders from six groups relevant for the model region. As outlined in the concept of the sociological research work we started with interviewing officials at the state level in order to get the official positions of the organized stakeholders and the state authorities and to get and the relevant information to identify the research sites or areas where conflicting stakeholder interact. It turned out that there is no small area of municipal size where a conflict is salient, rather the situation in the area where the large pond farms are situated (Pond Area - Teichlausitz) and the area in the south (Hill Country - Hügelland) are pretty homogeneous. The number of interviews was nearly equally distributed between both research areas. Although the number of interviewees may seem small to cover the whole model region with two research sites, it turned out that the discourses the people draw on are well shaped and quite common. During the last interviews no new storyline was uncovered. So the relatively small number of conducted interviews seems justified.

Table 4.1: Interviewed stakeholder groups and their spatial level

Number of Interviews		Spatial Level		
	Sum	local	regional	state
Sum	26	10	6	10
Stakeholder Group				
conservationists	8	4		4
aquaculturists	8	4	1	3
anglers	3	1	2	
State authorities	4	1	2	1
specialists/experts	3		1	2
tourism	(1)		(1)	

(1) one interview with persons from aquaculture and tourism.

4.1.2 Description of existing mitigation measures

During the interviews around 30 different measures to mitigate the conflict between fisheries and either conservation or the fish-eating vertebrates were mentioned. The measures range from general ideas like “Solution at the European level for the cormorant” to very specific traditional scaring methods like putting human hair around ponds as otters avoid the smell of humans.

The mitigation measures comprise
(1) policy instruments where the state is the actor, like compensation payments, and
(2) other mitigation actions from other actors, like scaring birds by own presence at the ponds or illegal killing of otters.
If e.g. a technical mitigation measure (like fences against otters) is subsidised by the state to foster their use by fisheries it is a question of perspective and depth of analysis who is the initial or dominating actor. To comply with the structure of the economic analysis of policy instruments carried out in WP5 and WP9 all mitigation measures which are investigated under WP5/9 are regarded as policy instruments to facilitate the interdisciplinary work.

4.1.2.1 Local Mitigation Measures

4.1.2.1.1 Scaring Without Killing (SWK)

A traditional way to keep otters away from the ponds is to put human hairs around the ponds as the otters avoid getting into areas with human smell. Also the presence of people at the ponds scares otters away. This is also true for cormorants. So it is repeatedly reported that one pond farmer scares away the cormorants every morning at sunrise. Of course also technical equipment which makes noise is used to scare cormorants. One specialist who was participant of the REDCAFE project mentioned the idea successfully applied in Israel to scare the cormorants to some place which is only for bird watching and not for fish production.

4.1.2.1.2 Distraction Ponds and alternative food resources (DIP)

This comprises distraction ponds especially designed and stocked with fish for otters or cormorants. Another alternative is additional stocking of commercial and wildlife species of fish at the commercial ponds and the angling waters. Also the more natural development of streams, especially the removal of blocking structures like hydropower stations and barrages, could lead to an increase of fish availability outside the fishing waters.

4.1.2.2 Illegal Actions

4.1.2.2.1 Illegal Killing of Otters (IKO)

Shooting otters or using e.g. spring traps to catch (and kill) otters at ponds were mentioned in some of the interviews.

4.1.2.2.2 Destroying Cormorant Breeding Sites (DCBS)

Until now any attempt of cormorants to establish a breeding colony in Saxony has been prevented, even in inaccessible sites like islands in lakes. From the interviews we got different statements concerning the legal status of these actions. Some accuse the destruction as illegal; others say that it is done with authorisation of the competent ministry.

4.1.2.3 Regulations

4.1.2.3.1 Protected Areas (including SACs of Habitat Directive) (PA)

Mainly the development of the management plans of Special Areas of Conservation (SAC) was mentioned in the interviews (mainly on request, not freely). In 2003 the Saxon State Agency for the Environment and Geology started to assign consulting engineers the task of developing the management plans for the SACs.

Some interviewees expressed the impression that the conservation regulations for aquaculture and angling are not really enforced. Breaking of regulations for specific protected areas was reported.

4.1.2.3.2 Protected Species (PS)

Sometimes interviewees draw on the fact that the model species are legally protected and arbitrary killing or disturbing is prohibited. This is not contested concerning the otter. The cormorant case is discussed under the heading "Change of hunting law".

4.1.2.3.3 Scaring By Killing (SBK)

One of the main mitigation measures against cormorants and herons is the possibility to get the permission from the conservation authorities to shoot birds to scare them away from the commercial ponds. This exemption of the protection is based on the rules of the Birds Directive. Anglers can not get this permission as only commercial fisheries are mentioned in the respective clause of the Directive.

4.1.2.3.4 Population Control (PC)

All kinds of actions with the objective of reducing the number of individuals or the population increase by directly killing, destroying eggs or breeding sites. It was reported in one interview that during GDR times hunters got a bonus of 50 GDR Marks for every cormorant shot.

4.1.2.3.5 Change of Hunting Law (CHL)

Some stakeholders would likte to change the hunting law by adding the cormorant to the list of huntable species in order to be able to use hunting to regulate the population.

4.1.2.4 Economic Instruments

4.1.2.4.1 Damage Compensation (DC)

Aquaculturists can apply for financial compensation if the damage due to non-huntable species like the cormorant exceeds a threshold value. In special cases of hardship also damages due to otters are compensated (although it is legally a huntable species, but actually not huntable). The normal compensation of otter damages is ex ante and paid in a lump-sum per hectare of pond surface. These compensations are paid by the Saxon state (partly backed by the EU agricultural funds) and are quite generous. For small hobby producers of carp the District Councils run their own compensation schemes. They replace carps eaten by otters directly by carps they buy from commercial aquaculturists. The total sum spend per year is normally less than 1,000 Euros for all cases in a district.
Some conservationists (also from state authorities for environment) say that the payments are (far) more generous than adequate and as the supervision by the authorities is not tough enough the state aid is more or less a self-service shop. On the other hand the aquaculturists say that only 60 up to 80 % of the calculated direct loss is compensated and indirect damage is not included, e.g. the carps hurt by cormorants are partly not saleable.

4.1.2.4.2 Compensation for environmentally sound pond management (NAK)

Since the political change in 89/90 there was a sequence of different compensation payment schemes for a more extensive aquaculture in order to cover the thus decreased production of carp (see Schwerdtner/Ring 2004, pp. 13). Especially conservationists reported that some

aquaculturists do not comply with the regulation of NAK-programme, e.g. feed their carps more than allowed.

4.1.2.4.3 State aid for technical measures (NF – Nets and Fences)

From EU funds for fisheries aquaculturists can get money to protect their premises especially the storage ponds against otters (or to set up a more modern marketing approach e.g. selling the fish directly at the premises to the local people, but this is not relevant for the conflict).

4.1.2.4.4 Financing Pond Ownership (FPO)

After the political change 89/90 the Saxon state financed the purchase of ponds by an association to conserve the cultural and natural heritage of Saxony (Landesverband Sächsischer Heimatschutz – Saxonian Homeland Protection). The Saxonian Homeland protection leases the ponds to aquaculturists but with environmental restrictions. Also other conservation associations received state aid for purchasing ponds.

4.1.2.5 Information

4.1.2.5.1 Species Conservation Programme Otter (SCPO)

In the year 1992 the Saxonian State Agency for Environment and Geology started to develop a conservation programme for the otter population (Steffens, 1996). This is not a legally binding action plan, but an information tool for all parties who can contribute to otter conservation, e.g. the road authorities to bear in mind the need of otters to cross roads and to follow the streams also under bridges. So the construction of tunnels under roads and to leave a pathway under bridges and similar measures were recommended.

4.1.2.5.2 Monitoring (MO)

There is a comprehensive cormorant monitoring system established in Saxony. Until some years ago the ornithologists and the fisheries association ran parallel monitoring schemes, but results were very similar so that the fisheries association withdrew from counting and now trusts the numbers the ornithologists present. The monitoring is financed by dues on fisheries (*Fischereiabgabe)*.

4.1.2.6 Solution at the European Level (SEL)

In the cases interviewees refer to a resolution at the European level for the cormorant they mostly do not express what exactly they have in mind. In most cases the request for a solution at the European level comes in combination with the idea of regulation of breeding sites in the countries where most cormorants come from (Denmark, Netherlands, sometimes Poland are mentioned). One interviewee saw the need for a preliminary step on German federal level before action at the European level should be done.

4.1.3 Description of the story lines

We could not identify different storylines in the different research areas, the Pond Area and the Hill Country. As the impact of the cormorant is less in the Hill Country than in the Pond Area, the corresponding storylines are less frequently told, but they do not differ. The same holds true the other way around for the otter and the Pond Area. Many interviewees know about the different situation in the two research areas and also talk about the other situation there. Therefore we do not distinguish between the two research areas while presenting and discussing the storylines.

4.1.3.1 The Otter Belongs to the Landscape (OBL)

The presence of the otter in Lusatia is widely accepted and mostly appreciated. The otter belongs to the Lusatian landscape, it has been present since ever, it gets its share of fish, and if necessary compensation is paid. The tourism agency uses the otter as a symbol for the healthiness of nature of the region and as an important element in their marketing material. This state of acceptance was reached through the extensive information work of honorary nature protection delegates during GDR-times. However, some interviewees stated that otters are only accepted as their presence is the basis for a more than adequate compensation payment for the fish they feed on. Along the same lines it is reported that some anglers and at least two aquaculturists do not accept the otter as part of their natural (or cultural) environment, but see it as an enemy.

4.1.3.2 Otter causes relevant Damage under Specific Circumstances (ODSC)

Although the otters are broadly accepted it is admitted that they cause significant damage under specific circumstances. The circumstances reported are that otters "wake up" wintering carps so that they loose too much energy to survive the winter; that they can take a lot of fish out of the storage basins, where the carps are stored during the selling season (also the winter). It is reported that small ponds, especially of hobby producers and some ponds with Koi carps have been emptied completely. In the case of the hobby producers most interviewees say that the damage is more emotional that economic.

4.1.3.3 Cormorants Belong to the Sea (CBS)

The cormorant is a sea bird not an inland bird. It has arrived here only in recent years and does not belong to the Lusatian landscape. The cormorants come to the inland waters because the overall European population is too high and cormorants come to the region in search of new sources of food.

4.1.3.4 Cormorants Cause Crucial Damages to fisheries (CCD)

Damage due to cormorants is relevant for large-scale aquaculture and has increased since the beginning of the 90ies. In differentiation to the otter the damage is short term, irregular, and can amount to the total loss of fish as cormorants hunt in flocks. The damage comprises not only the fish eaten but also the fish hurt which can not be sold due to the injuries.
In the past the angling waters – small ponds and streams – have not been affected. This changed in the last winter that was exceptionally severe and ponds were covered by ice for a longer period. Therefore anglers now blame the cormorant for causing relevant damages in streams and even endangering populations of protected fish species.

4.1.3.5 Local Cormorant Mitigation is only partially effective and not sufficient (LCM)

The scaring and shooting of cormorants is only effective for the particular ponds, but increases the energy demand and therefore the fish intake of the birds. Part of the local mitigation of cormorants is to avoid the establishment of a breeding colony in Saxony. But this is not enough to regulate the population of the cormorants down to a size suitable for the landscape. As the European cormorant population is very/too high further co-ordinated European-wide action especially in the countries with the large breeding sites, has to be undertaken to safeguard fisheries and prevent other damages, e.g. to protected fish species and roosting trees.

4.1.3.6 Extensive Compensation payments Calm down the Conflict with aquaculture (CCC)

The most important reason why there is no conflict about the fish-eating vertebrates with aquaculture is the generous compensation. This applies for all kinds of aquaculture: for otters and cormorants concerning the large-scale professional pond farming (paid by the Saxon state) and the compensation payments done by the District Councils for local small-scale hobby producers of carp. A considerable number of interviewees said that without the compensation aquaculture could not survive.

4.1.3.7 Ponds full of fish Invite Fish-eating animals (PIF)

As the ponds for aquaculture as well as for angling are man-made with a higher density of food than the surrounding landscape and also the streams are stocked with fish for angling, fish-eating vertebrates are attracted to these waters and to the region in general. The otter population can develop better and cormorants increasingly migrate to Saxony. But some stakeholders express the expectation that equilibrium between fish and predators has already or will soon be reached by nature's dynamics within the landscape.

The following three storylines are closely related but stress different aspects of the discourse.

4.1.3.8 Fisheries and Conservation Go Together (FCGT)

Representatives from all stakeholder groups draw directly or indirectly on facts that should give proof that nature conservation and aquaculture as well as angling are not contradictory, but can go together or are even complementary. The facts the interviewees report are that the carp ponds are rich biotopes for endangered species and if aquaculture closed down the ponds would slit up over the next decades and in consequence the biotopes would get lost. From the other perspective compensation payments out of nature conservation programmes helped aquaculturists overcome the economic difficulties after the German reunification and are still an important part of the balance sheet of the aquaculture enterprises. The aquaculturists work closely related to nature's dynamics and have to integrate their work therein.
Anglers also maintain the water bodies and e.g. clean up the garbage on the banks of ponds and streams. They also do a lot of educational work about nature, give the youth the chance to make intensive experience with nature, care about rare fish species and try to resettle them. On the other hand angling benefits from environmental protection due to cleaner water for the fish.

4.1.3.9 Nature Conservation Requires Management (CRM)

Most anglers and aquaculturists highlight that nature – or more specific, the water bodies - have to be managed to keep it in an ecologically sound and/or favourable status. The different interviewees refer to the facts that garbage has to be collected, that some maintenance work has to be done, and that even natural ponds or streams have to be supervised in order to be able to react if unwanted incidents occur. To leave everything to nature's dynamics can cause relevant damages even to nature and therefore has to be avoided.

4.1.3.10 Pond aquaculture has to be conserved as part of the Man-Made Landscape (MML)

Aquaculture has a long tradition and is important for the region. The Pond- and Heath-Landscape is a crucial part of the cultural landscape in Upper Lusatia. Therefore aquaculture is and should be supported on the necessary scale to enable it to survive. Most interviewees would agree that during the times of political and economic insecurity after 89/90 the payments from the conservation budget were crucial for the aquacultural enterprises to survive. Today some interviewees see the compensation payments for environmentally sound

pond management (NAK[10]) and the hardship compensation for cormorant damages as disguised subsidies and not really as nature conservation programmes, although they would agree that the aquaculture has to conserved. In reference to the man-made landscape many interviewees argue that interventions by humans are necessary and justified. The interventions also comprise the control of populations of fish-eating vertebrates.

4.1.3.11 We in Saxony Resolve Conflicts Cooperatively (RCC)

We here in Saxony's nature conservation/pond fisheries scene know each other mostly already from GDR and the times of political change in 89/90 and mainly resolve things cooperatively on a more or less informal level built on personal contacts. Sometimes anglers, conservationist, and local authorities claim not to get included in decision procedures and in addition accuse the parties actively involved of wheeling and dealing. It is reported that the supervision of the compliance with the regulations for environmentally sound pond management is not enough so that funds for nature conservation are not used efficiently or are even misused.
Nearly all stakeholder groups report that there are also persons who are not cooperating, but all agree that these are exceptions or "black sheep".

4.1.3.12 Decisions Should be Rational (DSR)

This story line is closely related to the cooperative resolution of conflicts. Several interviewees stress that decisions should be pragmatic rather than dogmatic or emotional. Others emphasize the need for a sound scientific base, or at least rational reasoning and due investigations on the subject. Nearly all interviewees who touched the question of "pragmatic or dogmatic" underlined that in Saxony mostly realistic or pragmatic people are active. A story often reported to underline that a person is not rational is that some conservationists are mono-dimensional: they are eager to protect their preferred species and overlook the negative impacts of the protection actions on other species or ecology as a whole. An analogous argument is that conservationists do not look into the water and therefore overlook endangered fish species.

4.2 Variation of opinions among stakeholders

4.2.1 by storylines

The following graphs show the position of the different stakeholder groups related to the twelve storylines identified. To make the graphs clearer we do not use the complete titles of the storylines but the abbreviations already used in the heading of the respective chapters (see also List of Abbreviations). The graphs have three dimensions: agreement, frequency, and importance. How important the storyline is for the respective stakeholder group is shown by varying the size of font in 3 steps: 9, 12 and 16 pt. The agreement is shown along the horizontal axis also in three qualitative steps. If there is not a unique judgement within a stakeholder group the *font is italic*. In the vertical dimension the frequency is shown. The assessment how often the respective stakeholder group draws on the storyline is a combination of how many different persons report on that storyline and how many times the storyline is touched upon within the interviews.

[10] for more information on NAK see Schwerdtner and Ring 2004, p. 11 ff

4.2.1.1 Conservationists

	Agree	Neutral	disagree
high	OBL LCM CCC *FCGT* RCC		*FCGT*
medium	ODSC *CBS* CCD		*CBS*
low	PIF MML DSR	CRM	

In contrast to the fishers the conservationists appreciate having cormorants in Saxony, but not unanimously. Some admit that the regional population is too high. Others would be delighted if a breeding colony established in Saxony, preferably in one of the newly developing lakes (due to closed down lignite open pit mines). One representative even shares the view that the cormorants do not belong to Lusatia and as the pond landscape is a Man-Made Landscape the cormorants should be scared away.
The SL that Fishery and Conservation Go Together is not shared by all conservationists. One person stressed the contradiction between the economic interest which should lead to intensive production and the need for extensive aquaculture to conserve nature.

4.2.1.2 Aquaculturists

	Agree	Neutral	Disagree
high	CBS CCD LCM FCGT RCC	CCC	
medium	ODSC MML DSR		
low	CRM	OBL PIF	

There are no storylines the aquaculturists disagree with. So we concluded that they dominate the discourse in the model region. Although they often relate to the SL Compensation Calms Conflict they seem to feel rather neutral about that storyline. From the interviews we got the impression that the aquaculturists give more importance to the case on fish-eating animals and fisheries than all other stakeholder groups. Especially the cormorant dominates the discourse of the pond farmers and they evoke that aquaculture vitally contributes to nature conservation (FCGT).
The aquaculturists especially from the Saxon fisheries association stress that the conservationists in Saxony act according to common-sense and are not dogmatic or extreme.

4.2.1.3 Anglers

	Agree	Neutral	disagree
high	*OBL* ODSC CCD FCGT CRM *RCC*		*OBL RCC*
medium	LCM PIF		
low	CBS DSR	CCC	

The statements of the anglers contain both that they disagree with resettlement of the otter and that they have to accept the existence and spreading of otters in their angling waters.
Anglers are not compensated for damages due to fish-eating vertebrates but agree that the compensation is a helpful means for mitigating the conflict, and therefore also want to be compensated.
Contrary to the aquaculturists the anglers do not draw on the SL man-made landscape but stress that water bodies have to be managed, so they refer to the SL nature Conservation Requires Management.
Concerning the cooperation in conflict resolution the anglers report examples of good and of bad cooperation with authorities and other stakeholders. As there are two competing anglers' associations, difficulties in coordination are mentioned more often.

4.2.1.4 Authorities

	Agree	Neutral	disagree
high	CCD CCC FCGT RCC		
medium	OBL ODSC PIF MML LCM DSR		CBS
low	CRM		

In contrast to the anglers and aquaculturists (and parts of the conservationists) the representatives of the nature conservation authorities do not agree with the SL that the cormorants should not be present in Lusatia.
It is agreed within the stakeholder group of authorities that here in Saxony conflicts are resolved cooperatively, pragmatic, and that the personal contacts between the actors foster cooperation. But this fact is not welcomed unanimously. Especially the conservation authorities claim that due to personal contacts decisions are made that are not always rationally based (SL DSR). But there are also voices who appreciate that all/most actors are ready for a compromise. The storylines concerning the cormorants are often reported, but the stories about otters are only reported in medium frequency. Most representatives told us that aquaculturists do accept and even appreciate the presence of the otters. So they do not seem fully aware that the otter also causes problems e.g. for anglers and hobby carp producers.

An interesting point is that the authorities hardly draw on the SL that nature conservation requires management (SL CRM).

4.2.1.5 Specialists/Experts

	Agree	Neutral	Disagree
high	CCD LCM CCC		
medium	OBL ODSC RCC DSR FCGT	MML	CBS CRM
low	PIF		

The group of specialists and experts is small and very diverse so it seemed questionable to create a common picture of this group.
It is interesting to see that the SL the Otter Belongs to the Landscape plays only a minor role, but this may be due to the fact, that for the otter specialists this goes without saying and for the cormorant specialist it was not in the focus of the interview. In contrary to the other stakeholder groups the specialists and experts share the view with the nature conservation authorities that it is an asset to have the cormorants in Lusatia. They disagree that Cormorants only Belong to the Sea.
We rated the SL MML as neutral as the specialists and experts refer to the idea that Lusatia is a man-made landscape, but they do not stress the role of ponds and aquaculture in the Lusatian landscape.
The specialists and experts did not stress the SL that conflicts are resolved cooperatively, but report that most actors know each other and work together. The SL FCGT is not understood as complementary, but only in the way that it is possible to balance the interests of nature conservation and fish production. In this respect the specialists and experts distinguish carefully between aquaculturists and anglers: while they see the aquaculturists as partners, they are very sceptical about anglers.
Concerning the SL nature Conservation Requires Management one expert strongly questioned that water bodies, especially streams, have to be managed to stay in a favourable state.

4.2.2 by management options

For a detailed analysis we choose the following 15 mitigation measures of major relevance to the stakeholders:

Table 4.2: List of discussed management options/mitigation measures

Abr.	Name of management option/mitigation measure
SWK	1. Scaring without killing
DIP	2. Distraction ponds and alternative food resources
IKO	3. Illegal killing of otters
DCBS	4. Destroying cormorant breeding sites
PA	5. Protected Areas (including SACs of Habitat Directive)
SBK	6. Scaring by killing
PC	7. Population control
CHL	8. Change of Hunting law
DC	9. Damage compensation
NAK	10. Compensation for environmentally sound pond management
NF	11. Subsidies for technical measures (nets and fences)
FPO	12. Financing pond ownership
SCPO	13. Species Conservation Programme Otter
MO	14. Monitoring
SEL	15. Solution at the European level

4.2.2.1 Conservationists

	Agree	neutral	disagree
high	DC NAK DIP FPO		
medium	PA *NF*	*SBK NF*	*SBK* IKO *NF*
low	*PC* SCPO	DCBS	*PC*

If there is not a unique judgement within a stakeholder group the *font is italic* and the abbreviation placed in more than one field of the graph. If a mitigation measure is (dis)agreed with in principle, but the stakeholders have a different opinion about details or their implementation, the abbreviation is underlined with a dotted line.

The compensation payments for environmentally friendly pond management (NAK) and the damage compensation (DC) are the mitigation measures which the conservationists talk most about. In principle they agree that these policy instruments should exist, but they criticise the concrete use to different degrees. The critic ranges from mentioning that the payments are somewhat high or there is no proper calculation basis to that money dedicated for nature conservation is misused to subsidise a business sector.
For some conservationists action to provide alternative food for otters in form of distraction ponds or additional stocking of fish, and revitalisation of streams to foster natural fish growth is an important theme (DIP). If conservationists talk about this issue they talk much about it and express the wish for more action of this type.
Concerning protected areas (PA) the conservationists report cases where the regulations are broken by aquaculturists or weakened by the authorities on request of the aquaculturists. The work of the consulting engineers who are in charge of developing the management plans for the Special Areas of Conservation based on the Habitats directive is mostly criticised for too little cooperation with the conservation associations and there is much scepticism expressed that these management plans will promote conservation.

As the owner of a piece of land has a very high level of influence what happens with this area and as there are very good experiences for conservation association leasing ponds to aquaculturists with specific regulations with regard to nature conservation many interviewees touch that point and ask for more money from the state to finance their purchase of pond areas (FPO).
Cases of illegal killing of otters by shooting or using steel traps (IKO) have been reported. Of course the conservationists do not agree, but they also claim that the authorities and the police are not eager to prosecute these cases.
Concerning the Scaring by killing (SBK) of cormorants the conservationists are divided. Some stress that it has no positive effect on fisheries and others stress that there are many negative effects on other species like water birds. They criticise that scaring by killing is also allowed during the breeding season (of other birds) and in protected areas.
Concerning technical measures (nets and fences NF) the conservationists judge case by case. So they disagree with nets on ponds to prevent cormorants from feeding, but they call for fences around the storage basins or small ponds for carps to protect them against otters.
With respect to population control of cormorants the conservationists are divided: some say that an inland population is valuable and the fishers have to accept the damage (if it is compensated by the state) others accept the idea of a carrying capacity of a landscape and ask for a regulation of cormorant numbers according to that carrying capacity.
The issue of the (illegal?) destruction of cormorant breeding sites is not of importance for the conservationists. Only one interviewee touched the issue and s/he took a more or less neutral position (DCBS).
The conservationists briefly mentioned that they had been able to influence the design of the Species Conservation Programme Otter (SCPO). One reported that the fishers claimed that they were not included in the process.
All other mitigation measures are of little interest to more than one of the interviewees out of the group of conservationists.

4.2.2.2 Aquaculturists

	agree	neutral	disagree
high	SBK PC DC NAK		
medium	SEL NF	SWK PA	
low	DCBS MO	DIP	

Aquaculturists are neutral about scaring without killing, they do not see very much effect, but they are not against it. The same holds true for distraction pond as “the animals eat where they want.” They also seem to be neutral about the development of management plans with respect to the Habitat Directive. They do not expect a lot of changes.
Scaring of cormorants by killing (shooting) is an important mitigation measure as it is the only thing the pond farmers can actively do against the birds (e.g. nets are not feasible as most ponds are too large). It is not generally allowed to shoot cormorants. The aquaculturists need a specific permission for a pond and a number of cormorants. Most of them told us that the nature conservation authorities are cooperative and do not act bureaucratically. Also a big issue is the call for a reduction of the entire cormorant population (PC). This is mostly

connected with the issue of a solution at the European level (SEL). For storage basins the protection against otters by fences is accepted as necessary and feasible especially as there is co-funding from the EU FIGF. Juvenile fish in small ponds can be protected with nets against cormorants (NF). The monitoring (MO) of the cormorants is welcomed by the aquaculturists. Aquaculturists do not mention illegal killing of otters (IKO). And they touch the issue of destruction of cormorant breeding sites (DCBS) only on request, not freely, although they see it as an indispensable mitigation measure.

4.2.2.3 Anglers

	Agree	neutral	disagree
high	PC DC		
medium	DIP		
low	*IKO*		*IKO*

The anglers are even more outspoken with regard to a rigid population control (PC) of cormorants than the aquaculturists are although they are not yet severely affected, but they can not apply for damage compensation (DC). So the demand for damage compensation is an important issue for the anglers. One angler mentioned that in a few cases the ex ante compensation for otters is paid for angling ponds. Another angler reported that some anglers would like to kill otters if they found them at their waters. But s/he did not agree that otters should be killed.
All other mitigation measures are only mentioned in a few text units in a more or less neutral way.

4.2.2.4 Authorities

	agree	neutral	disagree
high	NAK DC	SWK	
medium		SBK	
low	NF SCPO	SEL	DCBS

The authorities see the positive impact on conflict resolution of the different compensation payments (NAK, DC). With respect to the damage compensation especially for the cormorant they see the difficulties of a proper calculation of the damage and the danger that also the consequences of mismanagement by the aquaculturists are covered by the payments. The authorities also talk about the linkage of scaring and compensation. Some persons say that there should be no compensation if scaring by killing is allowed and if technical mitigation measures such as nets and fences are not properly installed. The evaluation here is somewhat

between neutral and disagreement. They report extensively the negative impacts of shooting on breeding water birds, but they do not really express the opinion that scaring should be forbidden.
The authorities only slightly touch the question of population control at the European level and the issue of prevention of the establishment of breeding sites in Saxony (DCBS) with a tendency of disagreement.
One interviewee stated that with the Species Conservation Programme Otter (SCPO a new quality in otter protection was reached as funds became available.

4.2.2.5 Specialists/experts

	agree	neutral	disagree
high	MO	*DC*	SBK
medium	*DC*		DCBS PC
low	DIP		

The cormorant expert strongly disagrees with the shooting of cormorants (SBK) especially to protect angling waters. S/he says that the fact that 300 - 400 cormorants a year are being shot de facto means the end of species protection. According to her/his opinion the shooting has no effect or even an adverse effect since scaring increases energy and therefore food demand. S/he is also against any population control by shooting (PC). S/he is in clear opposition to the destruction of breeding sites in Saxony, and it seemed that s/he also disagrees with actions at breeding sites in general. Damage compensation was considered important for conflict resolution; however, it was not easy to interpret her/his opinion about the hardship compensation scheme (DC). S/he also talks a lot about the difficulties of calculating damage correctly.
Concerning the otter the situation is different. The otter specialist stressed that the compensation scheme of the districts is very important and useful to calm the conflict in the Hill Country.
It is interesting to see that the specialists/experts express clear-cut opinions on issues instead of arguing in a neutral way.

4.3 Aggregation of opinions

4.3.1 by storylines

The following graph is somewhat different from the other graphs concerning the storylines. It shows on the horizontal axis the importance for the conflict management, mitigation or handling. The consensus about the storyline is expressed by the underlining with the principle: the less underlining, the fewer consensuses. On the vertical axis the overall frequency of the storylines in the interviews is shown.

	minor importance to all	important for a few	important for all
high		OBL ODSC CBS LCM	FCGT CCC RCC CCD
medium	PIF		DSR MML
low	CRM		

Legend for degree of consensus; principle: the less underlining, the fewer consensuses:
completely agreed
mostly agreed
slightly contested
moderately contested
highly contested

The most important storylines for conflict management are "Compensation Calms Conflict" (CCC), "Fisheries and Conservation Go Together" (FCGT), "Cormorant Cause Damage" (CCD), and "We here in Saxony Resolve Conflicts Cooperatively" (RCC). Nearly all interviewees draw on these storylines. They agree that the high amount of state compensation payments to aquaculturists for both model species, otters and cormorants, are the main reason that there is no open conflict. Part of the justification of the compensation payments is the storyline that the cormorants cause relevant damage to pond farms. As nearly all agree on these two storylines a stable solution of the cormorant problem is reached as long as the Saxon state is willing to pay these hundreds of thousands of Euros to the fish farmers. It is interesting that the storyline on the damages caused by otters is not important for conflict handling for all stakeholder groups according to the interviews. This may relate to the fact, that the cormorant case dominates the discourse at the moment although there are more different types of stakeholders affected by otter damages. While mostly the professional aquaculturists in the Pond Area are affected by cormorants, also anglers and hobby aquaculturists in the Hill Country as well as the Pond Area suffer damages by otters. That the SL ODSC is not important for all stakeholders may also be based on the storyline that the Otter Belongs to the Landscape (OBL) which is frequently reported. The storyline about the cormorants is contrary to that of the otters. The main theme is that the cormorants do not belong to the region. But this is the storyline with the least consensus as some conservationists and persons working for conservation authorities appreciate an inland population of cormorants and would like to have a breeding colony even in Saxony.

Storyline "We here in Saxony Resolve Conflicts Cooperatively" (RCC) is partially contested by stakeholders who are not included in the circle of those who cooperate and claim that the close cooperation leads to a mixing up of personal interests and conservation objectives. But in general all would agree that it helped a lot to find the reached solution that most actors in the field of conservation and fisheries know each other and are pragmatic and do not dogmatically fight for their position. To continue that kind of interaction is mostly appreciated.

The storyline "Fisheries and Conservation Go Together" (FCGT) is contested by some conservationists as they see a basic contradiction between the economic interest of the pond

farmers which leads them to intensive and therefore less environmentally friendly production. The storyline FCGT is – combined with the less frequently reported SL on man-made landscape (MML) – the frame of the discussion about compensation payments. On the basis that fisheries contribute to nature conservation they get subsidies for environmentally friendly pond management out of the EU-funded agricultural programme. Also these payments are called compensation. Within that programme also an ex ante compensation for fish eaten by otters is paid for the ponds where the presence of otters is verifiable. The demand for compensation for damages due to cormorants is also based on this line of argumentation. The storyline that fisheries, especially pond aquaculture, go together with nature conservation (FCGT) is embedded in the more fundamental storyline that Lusatia is a man-made landscape and the man-made ponds are a vital element of that landscape and therefore have to be conserved. This is also the basis for the strong political support from Parliament, the leading (conservative) party, and government for the carp farms. There are indications that this storyline is embodied in the mindset of all stakeholders, in spite of the fact that we were not able to directly identify this SL in all interviews. Therefore we rate its frequency only as medium, but as important for all stakeholders.

The storyline conservation of man-made landscape as well as the SL nature Conservation Requires Management (CRM) calls for human action. The difference is with regard to the level of abstraction. In the interviews we heard concrete demands for action from fisheries like control of fish populations or maintenance of banks of water bodies and created the SL CRM out of them. But nobody draws on that storyline in the context of management of the conflict with fish-eating vertebrates. The storyline is contested by the view that nature would be in a better state if anglers did less with the angling waters.

That Local Cormorant Mitigation is only partially effective (SL LCM) is the basic assumption that compensation has to be paid. The otter compensation is paid because the Saxons accept or want to have otters in their region (SL OBL), so they have to feed them. But the cormorant compensation is paid as there is no chance to do anything against the birds so they have to compensate the fish losses to maintain pond aquaculture (SL MML).

The SL Ponds Invite Fish-eating vertebrates (PIF) is of minor importance for the conflict management. It is used as a kind of barrier against demands for more mitigation action against the animals or higher compensation payments. The SL Decisions Should be Rational (DSR) is uncontested but not stressed by all interviewees, so our conclusion is that all would call for conflict management which is based on rationality, although some stakeholders claim that the compensation payments are disguised subsidies.

4.3.2 by management options

	minor importance to all	important for a few	important for all
high		SBK	NAK DC PC
medium	SWK	NF PA DIP	MO
low	IKO SCPO	FPO DCSB FIGF	SEL

Legend for degree of consensus; principle: the less underlining, the fewer consensuses:

completely agreed
mostly agreed
slightly contested
moderately contested
highly contested

The most contested management are the illegal actions against otters and cormorant breeding colonies, and the Scaring By Killing of cormorants *(Vergrämungsabschuss).* Of course nobody accuses him/herself of illegal actions. But the reports were more than "I have heard of …"-stories. Interviewees report own observations of steel traps or that breeding colonies have been destroyed.
That there is a compensation programme for environmentally sound pond management (NAK) is agreed by all stakeholders, but some claim a lack of supervision. They say that there is too much money spent or not enough conservation gained. The situation is similar for Protected Areas. All agree that protected areas are sensible, but the conservationists claim that the regulations are disregarded by the aquaculturists, and the fishers say that some of the regulations are so strict that proper aquaculture management is not possible.
The Distraction Ponds and other alternative sources for food are important for the conservation associations that run such ponds and are accepted as more or less effective by anglers and aquaculturists.
It is astonishing that the Species Protection Programme Otter plays such a minor role in the discourse about the mitigation measures although nobody criticised the programme. It seems that it had some impact on the authorities responsible for the planning of new roads and some aquaculturists got financial help for fences around their storage basins. But nowadays no concrete influence on the interviewed stakeholders was mentioned.

4.4 Alignment of stakeholders

This chapter discusses the storylines and management options on which stakeholder groups have different opinions. It is shown who is opposing and who is (potentially) cooperating.

4.4.1 by storylines

4.4.1.1 Cormorants Belong to the Sea (CBS)

While aquaculturists, anglers, and part of the conservationists agree with the storyline, experts, authorities, and the other part of the conservationists are happy to have this top-predator in Lusatia.

4.4.1.2 Resolve Conflicts Cooperatively (RCC)

The opinion that in Saxony there is a climate of cooperative conflict resolution is widespread in all stakeholder groups. And all stakeholder groups are in favour of it. Different stakeholder groups claim to different degrees that they are not included in the cooperative decision making. The aquaculturists never mention that they are not included, all other stakeholders to a minor degree.

4.4.1.3 nature Conservation Requires Management (CRM)

Only two interviewees strongly question this storyline. One expert asks for less or more adequate stocking of angling fish in streams and expresses the view that nature would develop better without human 'support'. One conservationist supports the idea of process

conservation/preservation for a special area. In other contexts both agree that human intervention is sensible.

4.4.2 by management options

4.4.2.1 Illegal Killing of Otters (IKO)

All interviewed stakeholders agree that lethal mitigation is not appropriate. It is reported on one aquaculturist who used steel traps and one who is suspected of shooting otters. On anglers it is reported that they might be in favour of killing otters, but no concrete cases are reported. In recent years a few shot otters were found and transferred to the Museum of Natural History in Kamenz.

4.4.2.2 Scaring By Killing (SBK)

Aquaculturists and anglers stress that this mitigation measure against cormorants is necessary, although they admit that it is not effective in terms of population control and only has a limited temporal effect. Conservationists and experts are against SBK in protected areas and during the breeding season of other water birds. The authorities are in charge of giving the permission for killing cormorants, some as consultant others as competent decision maker. So they report in a neutral way on the scaring by killing.

4.4.2.3 Financing Pond Ownership (FPO)

Conservation associations like the Saxonian Homeland Protection and NABU are very much in favour of owning ponds. One representative of an authority acknowledged the positive impact of the regulations in the lease contracts. The aquaculturists and anglers do not talk very much about this topic so it is difficult to interpret their position. There are some hints that they would prefer not being bound by conservation regulations in the lease contracts.

4.4.2.4 Population Control of cormorants (PC)

There is widespread agreement that the overall cormorant population is too high and therefore has to be controlled. Anglers and aquaculturists demand a reduction and part of the conservationists, authorities, and experts see that this is necessary and would accept it. One expert seems to be strictly against population control.

4.4.2.5 Destruction of Cormorant Breeding Sites (DCBS)

The aquaculturists and anglers are happy with the fact that all attempts of cormorants to establish a breeding colony so far have been avoided. Some conservationists are more or less neutral about this issue; others would like to see a local cormorant population developing. The authorities we interviewed have more or less the same position as the conservationists. The cormorant expert is strongly in favour of a breeding site.

4.5 Conclusions

4.5.1 Where would further knowledge be helpful

The legal and institutional analysis done in WP4 was focused on the legal basis and named the authorities involved, but did – of course – not explain how the political processes for decision making are organised, what informal communication structures exist, and how the authorities and other persons or groups interact. For the design of participatory decision

strategies and the design of a RAP which has a chance of being implemented knowledge about these structures and processes is vital.
The structure of decision making was not reported freely within the interviews in spite of the fact that several questions were included in the interview guidelines so this part of the social reality of the interaction of wildlife and fisheries is still not clear enough for the Saxon case. Our interpretation is that as the stakeholders see no realistic chance of improvement nobody is talking and/or thinking about possible strategies to change something. Another interpretation is that due to the cooperative climate the stakeholders feel as a closed group. If this is the case, it is clear that to strangers or newcomers like the interviewers these internal details of decision making and exercising power are not reported during a first contact. This hypothesis is supported by the fact that our self-introduction was unclear with regard to our possible role so the interviewees acted carefully. If we make clear, that we are willing and have the means (new scientific knowledge about otter ecology and policy instruments) to influence the still ongoing reconciliation process we might get access to this cooperative group of stakeholders (lobbyists) and authorities as experts. In this case the interviewees may get the impression that it pays off to inform us about the communication and informal decision structures.
It should be investigated why the Species Conservation Programme Otter is an issue of minor importance in all interviews. Only in two stakeholder groups was it mentioned at all and all interviewees touched the issue only once in the interview. As the Programme is what in the FRAP context would be called an Action Plan it is vital for the project to understand this process.
There are some hints that the extensive work of the honorary species delegate for the otter and the person who negotiated the lease contracts for the Saxonian Homeland Protection Association laid the base for the acceptance of the otter as part of the landscape. This could lead to the hypothesis that single trustworthy persons can change things over time and play an important role in conflict mitigation especially in groups with a traditional understanding of society as it can be supposed for fishers.
Another field of further enquiry should be why the EU funds from FIGF to build fences around storage basins are hardly ever utilised by the aquaculturists.

4.5.2 Implications for RAP in the German model region

The conflict between aquaculture and species conservation in Saxony can be conceptualised mainly as an economic conflict. The fish-eating vertebrates cause damage to the profitability of fish farmers or eat stocked angling fish, which leads to higher costs, as more fish has to be stocked to get the same quality of angling pleasure. There are minor non-economic aspects like the danger to loose the regional tradition of growing carp in ponds. But also this thread can be tackled by compensation payments to the affected fishers so they stay with managing the ponds (professional as well as part time or hobby producers). As the compensation payments enjoy a high legitimacy and the state and the administrative districts are willing to pay to keep up the traditional pond aquaculture there is no momentum to change the found solution. Although there is some discontentment with the calculation scheme nobody wants to bring up the case as the main actors from aquaculture are in fear that every change could lead to a worse situation.
One possible action in the region for the FRAP-team might be to inform the already started process of establishing a monitoring scheme also for otters to adjust the compensation for otters a bit more to the factual damage. But this seems to us a task of WP9 Policy Instruments based on the outcomes of WP2, 3, 4, 5, and 6. It has to be checked with the competent Ministry whether a participatory part in this further development in the already reconciled conflict could be welcomed. If there is no interest from the authorities and stakeholders

already included we do not see any justification for initiating a participatory process by our own means.

4.5.3 Possible lessons that can be generalized to other cases

Not only conflict resolution or mitigation approaches are needed. Also approaches to keep up existing and working mitigation are necessary. Existing mitigation can suddenly be faced with new challenges e.g. a diminishing sum for compensation payments. Another possible case is that new stakeholder groups appear in the conflict as the anglers do in Saxony as cormorants begin to feed in streams. In the generic FRAP it should be discussed how to include new stakeholder groups in already existing mitigation strategies before a harsh conflict is salient.
It should be tested as hypothesis in WP10 whether the intensive interviews of the kind conducted within WP6 by the persons who try to initiate the development of a RAP have a prominent role in the success of development and implementation of a RAP as all stakeholders get the impression that the promoters of the RAP have been listening to them. The experience of conducting long largely unstructured interviews in WP 6 confirms that it pays off. We gained a much better understanding of the actual state of interaction (or conflict) and the judgement about different mitigation measures by the persons directly affected. We also got information about mitigation measures not mentioned in the literature or in the media.
In cases where a storyline that "decision have to be rational" or based on scientific evidence exists it might be that scientists are in a good position to initiate a RAP.
There is some evidence from the interviews that education and information help to reconcile conflicts. The competent authorities and the experts report that interaction with the well-educated aquaculturists (masters, engineers, or even Ph.D. in fisheries technology) is remarkably easier than with the hobby producers and the anglers. So the educational material planned for WP10 might play an important role in the conflict mitigation process. But learning when people are already adult is a long lasting process so it may be necessary not only to design educational material, but also an educational process, perhaps over years, to overcome attitudes handed down from generation to generation, e.g. that fish-eating animals are enemies and to be killed. This argument is based on the statement of one of the experts who said that the whole information process which was successful with the aquaculturists now has to be repeated for the anglers as they now get increasingly affected by protected predators.
As also in Saxony where the conflict is resolved cases of illegal action against protected species are reported, it may be concluded that as part of the reconciliation group dynamics some "black sheep" have to be accepted and do not harm the general conflict mitigation. The assessment of a conflict should comprise the thorough investigation of the formal and informal ways of communication and decision making. Which stakeholders are already included in a participatory or cooperative process and which are not?
Based on this analysis, social impact assessment, and discourse analysis criteria should be developed in which cases a participatory approach can help to reconcile a conflict and under which circumstances a traditional decision making through politics, authorities, experts, and lobbying is the better way to do so. In the generic FRAP we could strive to give answers to the question how a stakeholder (group) could go about changing something in order to reduce the level of conflict.

4.6 List of abbreviations

SAC	Special Area of Conservation (Habitats Directive)
SL	Storyline
SPA	Special Protection Area (Birds Directive)

Mitigation Measures

CHL	Change of Hunting law
DC	Damage Compensation
DCBS	Destroying Cormorant Breeding Sites
DIP	Distraction Ponds and alternative food resources
FPO	Financing Pond Ownership
IKO	Illegal Killing of Otters
NAK	Compensation for environmentally sound pond management
NF	State aid for technical measures (Nets and Fences)
MO	Monitoring
PA	Protected Areas (including SACs of Habitat Directive)
PC	Population control
PS	Protected Species
SBK	Scaring by killing
SCPO	Species Conservation Programme Otter
SEL	Solution on the European Level
SWK	Scaring Without Killing

Storylines

CBS	Cormorants Belong to the Sea
CCC	Extensive Compensation payments Calm down the Conflict with aquaculture
CCD	Cormorants Cause Crucial damages to fisheries
CRM	Nature Conservation Requires Management
DSR	Decisions Should be Rational
FCGT	Fisheries and Conservation Go Together
LCM	Local Cormorant Mitigation is only partial effective and not sufficient
OBL	Otter belongs to the landscape
ODSC	Otter causes relevant Damage under Specific Circumstances
MML	Pond aquaculture has to be conserved as part of the Man-Made Landscape
PIF	Ponds full of fish Invite Fish-eating animals
RCC	We in Saxony Resolve Conflicts Cooperatively

4.7 References

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5 ITALY

5.1 Historical description of the conflict

The region of our interest is the Province of Ferrara, Region Emilia-Romagna, located in the Po area , and facing the Adriatic sea at East.

The importance of aquaculture and fisheries in the Province of Ferrara is renown but it shows with even more strength in the analysed territorial district made up of the three model region Communes, where together with agriculture and tourism, they play a major role also in terms of employment.
The situation in Goro is really peculiar: only 25.3% of the population works in the tertiary sector and slightly more than 20% in the industrial sector. A very small percentage is employed in the primary sector, while 50.8% work in fishery: 980 of 1,927 workers.

Aquaculture and namely clam culture are particularly developed in Goro where it boosted in the past 20 years with the import of the exogenous species (*Tapes philippinarum*). Which spurred the creation of hundreds of micro enterprises in clam culture. But the extensive aquaculture in all the three Communes dates back several centuries and has reduced its importance only in the past century following extensive reclamation works.

The area of Comacchio – Porto Garibaldi is within the Province the most linked to **maritime fisheries** with a substantial fleet and a long lasting tradition.

It must be highlighted that the conflict in the Model region in Italy is more an aquaculture issue than a fisheries one. Fishermen in the model region, until now, do not feel the pressure of fish eating birds as a menace to their activity.

The conflict with aquaculture producers in Ferrara province, is not quite as sharp as close-by Ravenna Province. With the same set of legislation and administrative structure, it is apparent that the difference has been made by attitude of the Province of Ferrara administration in handling the stock (until 1992) of conflict (refunding claims) and setting up a procedure for compensation and mitigation efforts funding that proved effective (all stakeholders are involved in such process).

The hunting revenues make often more than half the gross turnover of "Valli" extensive aquaculture and risk to become the greatest source of income.
The main ecological risk associated with this perspective is that the management practices for extensive aquaculture (water salinity and bank vegetation control and the resulting enhanced fish production) sustain the presence of both increased aquatic and birds biodiversity, while unmanaged "Valli" tend to have extreme salinity conditions (low and high) and to severely limit the natural environmental carrying capacity and species diversity.

After completion of the interviews and discourses analysis provided for by WP6, we can assert that the conflict is perceived at all levels of administration: from the national relevant Ministry of Agricultural, food and forestry Policies (MIPAF), in charge also of maritime fisheries and aquaculture - in which it appears very clearly stated in a multi annual guidance

plan for this sector[11] , downwards to the town hall administrations.
While all concerned administrations and rulers are well acquainted with the problem, they are not always equally successful in their efforts to mitigate or reconcile such conflict.

The conflict is also described more in general in national and regional (more in detail) legislation about wild fauna protection and compensation schemes for damages caused by its protection have been put in place.

For historical reasons, property and users rights, the extensive finfish aquaculture carried on in brackish waters Ferrara province falls within the "fisheries in internal waters" rather than maritime fisheries as the great majority of other coastal lagoons in Italy.

Since inland fisheries has been a regional competence since 1977, and even more competencies in fisheries and aquaculture management have been handed over to the Region since then, there is little in the National level fisheries policy that directly affects the conflict.

> The conflict management approach - which is felt within the public administration since the early '90ies and is therefore highly institutionalised - is based on the blend of four main policy tools, all of which are publicly funded (entirely or co-funded). Of course, all these tools are generated at first as **Regulation instruments**, together with sanctions – based on the command and control approach. However, the first two are actually **Economic instruments.**
>
> ??Technical/ecological mitigation measures based upon data acquisition (population censes and research on ecological mitigation)
>
> ??Law regulated involvement of stakeholders in use of funds for mitigation and financial damage assessment and compensation
>
> ??Lately (2002-2003), population control plans that include ecological measures (disturbance at nesting and roosting sites) and shooting 200 specimens/year (out of 2700 migrants as average in January)

5.1.1 Conflict evolution and future scenarios

The conflict is presently at stable levels and under control in the Province of Ferrara, but the financial resources are under reconsideration (State annual financial law) and things may change with less resources for the Region Emilia Romagna and consequently for the Province for damage compensation.
However, the perception that there is a growing population of migrant cormorants (may be wrong, but this is what producers perceive), pending court verdicts in Ravenna over millionaire compensation claims, which may influence all national jurisdiction, and the insecure financial resources for compensation and funding, project a strong fear that the conflict might step up, although not to the level of Ravenna where it drags in courts since years.

The still open issues of the conflict – which might evolve in a near future - are represented by:

?? Individual farmers often act on their own initiative without respecting rules and timing

[11] Ref. Paragraph on MAGPs in fisheries policy chapter

given by the legal and administrative frame

?? The extensive aquaculture farmers have a positive influence in preserving fragile brackish environments, yet they feel they do not have the demanded role in the management of wetlands in the park areas and buffer zones;
?? The park restrictions on hunting add on top of the fact that cormorants are not in the list of huntable species in the national legislation, making a direct limitation process more difficult
?? The Province has the actual mandate to refund damages by delegation of the Region which acts through the means of transfer of legislation implementation and related objectives to the Provinces in a frame of decentralisation (principle of subsidiarity).
?? Unclear or overlapping competencies in management among different administrations
?? Loopholes and contradictions in national vs. regional laws, especially relevant to hunting in Park buffer zones.
?? Hunting in derogation envolves also a national and EU level

Thus, pressure is still felt and the present level of conflict might be on the increase, because:

- An application of the subsidiarity principle gives very different approaches even in neighbouring provinces (North, Rovigo, south Ravenna) of the Po Delta.
- Funds for compensation are fully utilised and probably at an upper limit, and no or little funding is available for technical mitigation
- Courts decisions pending in Ravenna, may spur higher financial damage requests from producers
- Environmentalists are unhappy with direct killing of birds and suppression of roosting sites and nests admitted by the new population control plan
- Aquaculture producers are more organised than before and feel a more attentive political climate
- Stakeholders see this situation mostly as a loose-loose situation
- Costs and damages – direct and indirect - are identified in detail while benefits are not, and often given for granted

5.1.2 Description of existing mitigation measures

The cormorants/aquaculture conflict is a problem which is strongly felt amongst aquaculture producers especially in the Po Delta Park area, in which there are strong hunting limitations and also limitations to the way in which aquaculture is carried on. Its management happens within a much broader frame of hunting and wildlife management, protected areas and – more generally - environmental management.

The body of legislation and administrative framework for mitigation measures for conflicts between wildlife species and productive activities covers also the interaction between fish-eating vertebrates and aquaculture activities which have been equated to agricultural activities, while capture fisheries is not taken in consideration, on the grounds that it takes publicly owned natural resources.

As said, the conflict management approach - which is felt within the public administration since the early '90ies and is therefore highly institutionalised - is based on the blend of four main tools, all of which are entirely - or partially - publicly funded:

- ecological mitigation
- financial damage compensation
- data acquisition (population censes and research on ecological mitigation)
- population control plans (including culling of 200 specimens)

The analysis of sanctions issued on the basis of the infringement of hunting laws, including protection of species and non-huntable species lists, revealed a very loose link with the conflict. In fact only few sanctions for hunting in prohibited wet areas could be eventually re-conducted to the dissuasion or direct killing of cormorants. In fact, it is more likely that hunters caught shooting in wetlands were after more valued game species.

Other interviews make us think that the control over illegal shooting of cormorants in wetlands is made difficult by scarce resources: financial technical and human resources (a problem often found in command and control approaches to environmental management). However intentional shooting for population control is also made uneasy by the shy attitude of the birds that move to other areas and learn easily.

This ecological trait of the cormorants behaviour counter-balances the effects that the scarcity of control resources over direct shooting could produce.

The **ecological mitigation** measures have proved useful in many cases and are a pre-condition for financial compensation for damage.

The nature ecological mitigation tools that have been deployed until now include acoustic prevention measures (as gas cannons, blank shotguns, noise emission, recorded stress calls and radio frequencies), mechanical prevention measures (as metal perimetral fences, individual basin fences and netting "shelters" in plastic netting), scarecrows, habitat reduction (as suppressing birds roosting areas, or vegetation maintenance along the pond banks), technical measures for extensive aquaculture engineering (habitat maintenance and or construction), unauthorised shots (these are illegal), and allowed disturbing actions with laser beams and with flat bottomed speed motor boats.

Namely net coverage of intensive rearing basins, and portions of the extensive rearing farms where fish are more concentrated has proven to be effective. Several economic instruments are in place for funding such preventive measures, and public resources have funded in the past the first installations of such devices.

However, **the analysis of the expenditure of the two main fisheries aimed funds, have proved that such funding is ignored by the potential beneficiaries**, which mostly pay by themselves the cost of purchase and installation or maintenance of such devices. The reasons are unknown but a certain degree of complexity in filing the requests, or the limited percentages of co-funding could be deterrents towards their use.

All other measures such as gas cannons, fear cries and the like proved useful only for very limited spans of time until the birds got used to them. To this end , also many **studies and research** have been carried out but with scarce results. This is about all – together with the training of foresters from the Province offices – that was found in the way of **Training and information**.

The main conflict management tool until three years ago has been the **financial compensation of damages**. This is deliberated within the "Consulta caccia" , a body in which all stakeholders take part. Specific methodologies have been devised (and revised very recently in October 2003) for damage assessment and for reimbursement and have proved very helpful in the conflict management. However, limited funds and stepping up of the

conflict by bordering provinces in which hunting has been permitted, are making this instrument insufficient.

Therefore the latest step taken by the public administrations in charge of managing conflicts generated by wildlife fauna, has been a **population control plan , that now allows blank shooting for dissuasion, roosting and nesting sites suppression, and direct killing of 200 specimens per year.**

While controlling the local population growth, by elimination of nesting sites, this control measure is felt by several respondents as ineffective in containing the wintering (migrant) population and is regarded by the Public administration, more for its psychological effects on certain stakeholders groups, than for its effects on cormorants population. The direct killing is however opposed by environmentalist groups.

As a last comment deriving from wp6 interviews, we can add that the problem is felt to be not only a local problem and that should be tackled at a larger, European scale. The principle of subsidiarity is here adopted only to improve the efficiency of local action plans, which are however regarded as insufficient.

The underlining idea behind WP4 (regulatory and administrative framework) investigation work was that appropriate regulations and administrative tools - and eventually economic instruments - can help in conflict mitigation and reconciliation.
While this is certainly true, we have the proof that tools, funding and regulatory mechanisms are not sufficient. Proof is that in the Province of Ravenna, bordering south the Province of Ferrara, the conflict has arisen to such a degree that public administrations have been sued by fish breeders and conflicts and economic compensation requests have soared.

Yet – Ravenna being in the same Region as Ferrara – all the regulatory and administrative framework is the same. **This demonstrates – if needed - that management "tools" just like other tools need to be handed properly to produce the expected results. In this case best practices and political goodwill are also needed to exploit the possibilities provided by the framework in place.**

As a last comment deriving from wp6 interviews, we can add that the problem is felt by some respondents to be not only a local problem and that should be tackled at a larger, European scale.
However specific stakeholders groups are very reluctant to see "imported" management schemes applied locally.
The principle of subsidiarity is here adopted to improve the efficiency of local action plans, which are however regarded by some public officers as insufficient.

Table 5.1 Mitigation measures and instruments: origins, implementation and efficacy

NATURE OF MITIGATION TOOL	ORIGIN	IMPLEMENTATION	FUNDING	NOTES
Financial compensation	L.R.8/94, art.li 17,18 e 28. D.G. 2338 del 19.12.2000 D.G on damage compensation procedures of October 2003	Public	Public, regional funding, 100% of the estimated fish intake as calculated by P.adm. Only 30% is actually reimbursed if the fish farming company activities also include hunting.	Made possible from the equiparation of aquaculture to agriculture as for L.R 11/93.
Acoustic prevention measures Gas cannons, blank shotguns, noise emission; recorded stress calls; radio frequencies.	Pressions from P.adm. on privates as a condition to obtain financial reimbursements for damage. D.G. 2338 del 19.12.2000	Collaboration public/private sectors	Public contribution of 100% for material purchase.	Often loose efficacy in short time spans
Mechanical prevention measures Metal perimetral Fences; Individual basin fences and netting "shelters" in plastic netting .	Giunta Regionale. D.G. 2338 del 19.12.2000	Collaboration public/private sectors	Public contribution of 100% for material purchase.	Plastic netting tends to wear out and is labour intensive at the set-up Funding is upon request for materials refunding from the entrepreneurs (but is often insufficient)
Scarecrows	Private entrepreneur	Private	Funding not available	One entrepreneur claims good degree of success
Habitat reduction (suppressing bird dorms)	Pressions from P.adm. on privates as a condition to obtain financial compensation for damage.	Private-public early collaboration in terms of project phase for land use planning .	Funding not available	Actions carried out by privates within public planning
Technical measures for extensive aquaculture engineering (habitat maintenance and or contruction)	Region – Guidelines for aquaculture engineering aimed at minimising birds predation (slope inclination; elimination of restino sites such	Public /private	Funding not available	Needs training and good information on the side of entrepreneurs as well as early involvement of nature experts in the planning of aquaculture facilities.

	as poles etc.)			
Non authorised shots (illegal)	Private	Private	--------	Action taken by aquaculture entrepreneurs when bird population densities are "unsustainable"
Disturbing actions with flat bottomed boats	Private	Private	--------	Action taken by aquaculture entrepreneurs. Labour intensive thus costly but considered effective.
Population control plan	L.R. 8/94 Po Delta Park territorial planning and own Regulation	Coordination Province and Po Delta Park authority	Not available	Ferrara province has a currently approved a plan for cormorants population control limitation but with very limited killings.

5.2 Variation of opinions among stakeholders (by storylines)

5.2.1 Description of the storylines, stakeholders positions and patterns

Storylines as a medium of reading through the interviews was felt as an inadequate tool by the Italian team, and management options were used in order to describe the respondents outputs in Lisbon.
The original storylines that were uncomfortably drafted before the management options graphs were utilised, have been later re-considered since the double description approach was adopted after the SEC meeting in Lisbon.

They are presented following the suggested facts (F) /values (V) /interests (I) sequence. The positions of the various stakeholders groups are then put in graphs and the main patterns illustrated with text.

5.2.2 "Cormorants are not an autochthonous species"

Cormorants are present in large number in the region especially in the winter, but since they are migrants and come from northern countries in large numbers, only in a relatively recent past, since the beginning of the eighties some people think they are not part of the local wild fauna (F) Thus they should be culled since they are not part of the local biodiversity (V) and cause damages to the aquaculture producers, the aquatic fauna and make less financial resources available for other environmental objectives (I)

Figure 5.1: Position of stakeholders groups on storyline N.1 "Cormorants are not an autochthonous species"

HIGH				
MEDIUM HIGH				Fish farmers
MEDIUM		Environmental groups		
LOW	Public Administration (did never mention the fact)	Hunters		
	1	2	3	4

Legend: Y axis: frequency with which the discourse was made; x axis: importance attributed
Cells: express position of stakeholder group, and colour agreement with statement
Red= complete disagreement; Yellow=partial disagreement Gray = neutral Blue= partial agreement
Green= complete agreement

Patterns in figure 5.1: The P.A: tends rather to consider the presence of cormorants a success of environmental policies of the 80ies that however turned out to be a problem since the early nineties due to their number and pressure on fish farms. The environmental groups are more informed about the fact that this species is a highly migratory one, but one respondent felt that their migratory attitude was due to disturbance in other countries, Hunters do not mention often this fact and attach to it a weak importance in the larger scenario of environmental management and damage caused by protected species overall. Fish farmers on the contrary are fully convinced that these animals are not autochthonous and therefore should not be regarded as local biodiversity and liberally culled and disturbed to the benefit of other species and of aquaculture activities.

Statements illustrating patterns in figure 5.1

?? "I have an identification ring from a cormorant caught and released in Poland: these are not autochthons species".
?? "Of course they fly down here! Up in northern Europe, like in Denmark, they are massacred!"

5.2.3 Cormorants are not a problem, herons are! (Cormorants cause problems)

The story is about the difficulty in assessing if and how much damage is caused in reality by cormorants if and what kind of damages cormorants cause - direct or not - It also points out the fact that they are not the only ones to cause damages but also other fish eating birds (F).
The debate whether they cause damage or not and to what extent is not yet settled (V) the resulting management proposals differ accordingly (I).

Figure 5.2: Position of stakeholders groups on storyline N.2"Cormorants cause problems"

HIGH		Hunters (respondants attach various degrees of importance)	Hunters (respondants attach various degrees of importance)	Fish farmers
MEDIUM HIGH	Environmental groups (some deny damage)	Public Administration		
MEDIUM				
LOW				
	1	2	3	4

Legend: Y axis: frequency with which the discourse was made; x axis: importance attributed
Cells: express position of stakeholder group, and colour agreement with statement
Red= complete disagreement; Yellow=partial disagreement Gray = neutral Blue= partial agreement
Green= complete agreement

Patterns in figure 5.2: Some of the environmental associations still are not fully convinced that presently (2003) after several disturbance actions (roosting sites and some culling) the cormorants still do cause damage, and they do not draw so often on this theme. Hunters and fish farmers are much more concerned in this respect, make this statement often, and put high cormorants damages in their priorities when it comes to use of financial resources for environmental management (hunters) and of the extensive aquaculture economic survival (fish farmers). The public administration has registered this pression since the early nineties and reflected it in legislation and management tools. Perhaps for this reason they do not always refer to this fact since it probably is part of the background assumptions and put it in a more general frame of protected species, wildlife management and environmental management, although at a medium high priority.

Statements illustrating patterns in figure 5.2

- "In twenty years of activity I have observed a constant reduction in terms of production results, in terms of harvested quantities. I see the cormorants as the principal responsibles with their great population numbers settling in the "valli" and their great capacity of adaptation to environmental changes."
- Cormorants are not a problem, herons are !"
- "The damages that are caused are not limited only to the fish directly killed, but also to fish killed by stress and not eaten. This is to say indirect damages as well. My request for mitigation would be never to see cormorants any more."
- If the cormorants do cause damages…and you will forgive me if I say that this is still to be demonstrated "
- "In Valle Bertuzzi now there is not a single cormorant left. And also in Valle nuova which is not very distinct from Valle Bertuzzi (they were actually one same "valli" in the past).

5.2.4 We cannot live only of tourism

The economy in the wetlands of Ferrara is increasingly aiming at tourism development (F) but this comes to the detriment of other more traditional economic activities in the area and risks

to create a more fragile monoculture economy (V) and existing economic activities resist this trend also on the basis of culture and local tradition

Figure 5.3: Position of stakeholders groups on storyline N.2 "We cannot live only of tourism"

HIGH				
MEDIUM HIGH				
MEDIUM			Public Administration Hunters	Fish farmers
LOW	Environmental groups			
	1	2	3	4

Legend: Y axis: frequency with which the discourse was made; x axis: importance attributed
Cells: express position of stakeholder group, and colour agreement with statement
Red= complete disagreement; Yellow=partial dis agreement Gray = neutral Blue= partial agreement
Green= complete agreement

Patterns read in figure 5.3 show a substantial agreement among stakeholders that tourism cannot be the only economic resource of the area, although much effort is made by several groups in this direction to get off the ground other forms of tourism (hunting in the fish farms; environmental tourism as bird-watching in the park area; eno-gastronomic and cultural tourism) as opposed to the traditional sun and sea tourism product. Few respondents especially from Comacchio – the most fisheries rooted town - also underlined the importance of culture and tradition in the local landscape and territorial management.

Statements illustrating patterns in figure 5.3

?? "Cultural heritage is also closely connected with aquaculture and the environmental preservation in the area"..
?? "Comacchio without the eels would be no more Comacchio"

5.2.5 Damage cannot be fully refunded

Is about one of the most often mentioned points of problem solving, present and future: damage compensation. Which cannot do without appropriate funding (F) How it is measured, how compensation is decided, if or not it should be granted to fish farming entrepreneurs in the Park area, and to what extent this contributes in solving the conflict is highly debated (V) due to conflicting interests of stakeholders groups (I).

Figure 5.4: Position of stakeholders groups on storyline N.4 "Damage cannot be fully refunded"

HIGH				Public Administration (positions vary largely, but the principle is agreed upon)
MEDIUM HIGH				
MEDIUM	Environmental groups	Fish farmers	Hunters	
LOW				
	1	2	3	4

Legend: Y axis: frequency with which the discourse was made; x axis: importance attributed
Cells: express position of stakeholder group, and colour agreement with statement
Red= complete disagreement; Yellow=partial disagreement Gray = neutral Blue= partial agreement
Green= complete agreement

Patterns in figure 5.4: Compensation is one of the core elements of conflict reconciliation policy put in place by the public administration. However the changing environment (In bordering provinces management is more based on culling, or financial compensation not settled) makes this theme still very hot and debated. **Environmental groups** are cautious in recognising the damage, but generally agree on the principle that this should be refunded. **Hunters** are concerned that this compensation money is absorbing financial resources for environmental ad wildlife management and want to reduce the populations by shooting to reduce present re-funding levels (which they perceive at much higher levels than in reality). **Administrators** accept the principle but with very different views, some denying the right to full compensation, others suggesting to increase such funds and to pay lump sums in advance to cover the birds eating damage risks. **Fish farmers** are not fully satisfied with the damage assessment procedures (claim that indirect damage is not calculated) and would rather shoot as a disturbance and population reduction mean as a solution to predation in the ponds.

Statements illustrating patterns in figure 5.4

?? "Many *valli* have largely relied upon public funding since the eighties. Many of them here in Emilia Romagna work for public incentives."
?? "Aquatic birds are part of natural phenomena just like thunderstorms or hail. It cannot be expected that aquaculture activities are started on extensive basis in several hectares of "valli" and - if some birds - or many for this purpose feed on fish, the damage compensation be total."
?? "We have heard rumours that other aquaculture producers had received about 200 thousand euros for damage compensation… somebody is taking advantage of this situation.
?? "Consideration of the wider environmental policy is needed in assessing damage or compensation and also in environmental investment overall".

5.2.6 Shooting is useless in population control

Shooting has been recently introduced in population control plans for cormorants (F) but the ethics, need and effectiveness are highly controversial (V) and reflect diverging interests (I)

Figure 5.5: Position of stakeholders groups on storyline N.5 "Shooting is useless in population control"

HIGH				Environmental groups Fish farmers
MEDIUM HIGH		Public Administration	Hunters	
MEDIUM				
LOW				
	1	2	3	4

Legend: Y axis: frequency with which the discourse was made; x axis: importance attributed
Cells: express position of stakeholder group, and colour agreement with statement
Red= complete disagreement; Yellow=partial disagreement Gray = neutral Blue= partial agreement
Green= complete agreement

Patterns in figure 5.5: This is the most debated issue in current management. Although the statement is about usefulness of culling in management, the killing of animals is what is harshly debated among environmentalists on one side and fish farmers and hunters associations on the other. Some differences within groups are however found but not enough to justify splitting the groups. The public administration is more prone to non cruent population control systems and acknowledges more the psychological effect of culling few hundred birds than the actual effectiveness in cormorant population management. Thisis also because they recognise the problem as being not only local (see storyline 7).

Statements illustrating patterns in figure 5.5

?? "The control of fauna populations is important but the birds populations reduction should possibly avoid direct killing"
?? "Mitigation measures should focus on potential modification of the behaviour of the birds by making feeding in the "Valli" less attractive to them"
?? "Exceeding populations of few species : gulls, cormorants, nutrias etc. are detrimental to other rarer less opportunistic species. Environmental erosion reduces the chances for the latter. Many species are locally extinct now. Fish fauna in all wetlands and canals also suffer this large population of fish eaters".
?? "We cannot endorse the killing of birds"

5.2.7 More information is needed

All management options are based on data (F) but the interpretation is controversial (V) and makes several stakeholders groups push for better and more data for different reasons, including traditional knowledge (I)

Figure 5.6: Position of stakeholders groups on storyline N.6 "More information is needed"

HIGH				Environmental groups
MEDIUM HIGH			Public Administration	
MEDIUM		Fish farmers		
LOW		Hunters		
	1	2	3	4

Legend: Y axis: frequency with which the discourse was made; x axis: importance attributed
Cells: express position of stakeholder group, and colour agreement with statement
Red= complete disagreement; Yellow=partial disagreement Gray = neutral Blue= partial agreement
Green= complete agreement

Patterns in figure 5.6: This is another area of substantial agreement however the rationale over the need for more or diverse (traditional knowledge) information is often completely opposed: Environmentalists say that feeding patterns and actual intake are little known and exaggerate damage claims, hunters are in an almost neutral position, but express their support to informed decisions, intending that this would speak in favour of a population reduction of cormorants. The PA needs data such as census and diet spectrum, or market values to assess damage claims, and fish farmers feel that traditional knowledge is little considered and would like to add more in the information and management picture. It also asks for better knowledge of the aquatic – less mobile - biodiversity , and quantification of benefits of the present situation. Many stakeholders on different sides have invoked involvement of more competent people in the conflict management and data acquisition and handling, thus suggesting that they are unsatisfied with present conditions under this profile.

Statements illustrating patterns in figure 5.6

"(…) Costs are well defined while the potential benefits of the present situation have not been highlighted yet."

"Promoting research is important to understand the true size of populations- always announced by the thousands, and never seen in such numbers. Thus establishing true data is important: organising birds census but also understanding what is under the water in order to correctly assess damage that is caused by the birds".

"Information and discussion on factual information are needed".

"The public administration is scarcely respondent to our needs. When we ask authorisation to re-open a previously existing freshwater inlet, and they reply "what for ?" … the chance of understanding each other is truly hindered."

5.2.8 Cormorants are not only a local problem

The geographical and political scale of the problem, exceeds local management capabilities including legal and administrative competencies (F) Therefore – due to the migratory character of this species, local population control is often considered only a palliative (V) but some would be perfectly happy with a local culling and disturbance pushing the birds somewhere else (I)

Figure 5.7: Position of stakeholders groups on storyline N.7 "Cormorants are not only a local problem"

HIGH		Fish farmers	Public Administration	
MEDIUM HIGH				
MEDIUM		Environmental groups (green is over term " local", not over problem) Hunters		
LOW				
	1	2	3	4

Legend: Y axis: frequency with which the discourse was made; x axis: importance attributed
Cells: express position of stakeholder group, and colour agreement with statement
Red= complete disagreement; Yellow=partial disagreement Gray = neutral Blue= partial agreement
Green= complete agreement

Patterns in figure 5.7 show substantial agreement over the fact that cormorants do not create problems or are perceived as such only at local level. However, while the degree of agreement is very strong on this fact, the is a high reluctance in importing other management schemes from outside, be them more liberal in birds culling (as in Rovigo, as proposed by fish farmers) or less so (as suggested by environmentalist associations).

Statements illustrating patterns in figure 5.7

?? "The protection status of the cormorant is totally unclear, since in the legislation of the nearby Veneto it has become a huntable species…therefore the need to tackle the problem at the level of the whole Adriatic coast"

?? The question over who holds the competencies over cormorant management is a very difficult one because there are on-going discussions at European and national level whether the cormorant should be made huntable or not. Otherwise the competencies are of the State or Region. But cormorants being a migratory species it is right to tackle this at European level.

5.3 Variation of opinions among stakeholders (by management options)

5.3.1 Perspectives in conflict management

Future perspectives of conflict management and related options are based upon or influenced by :

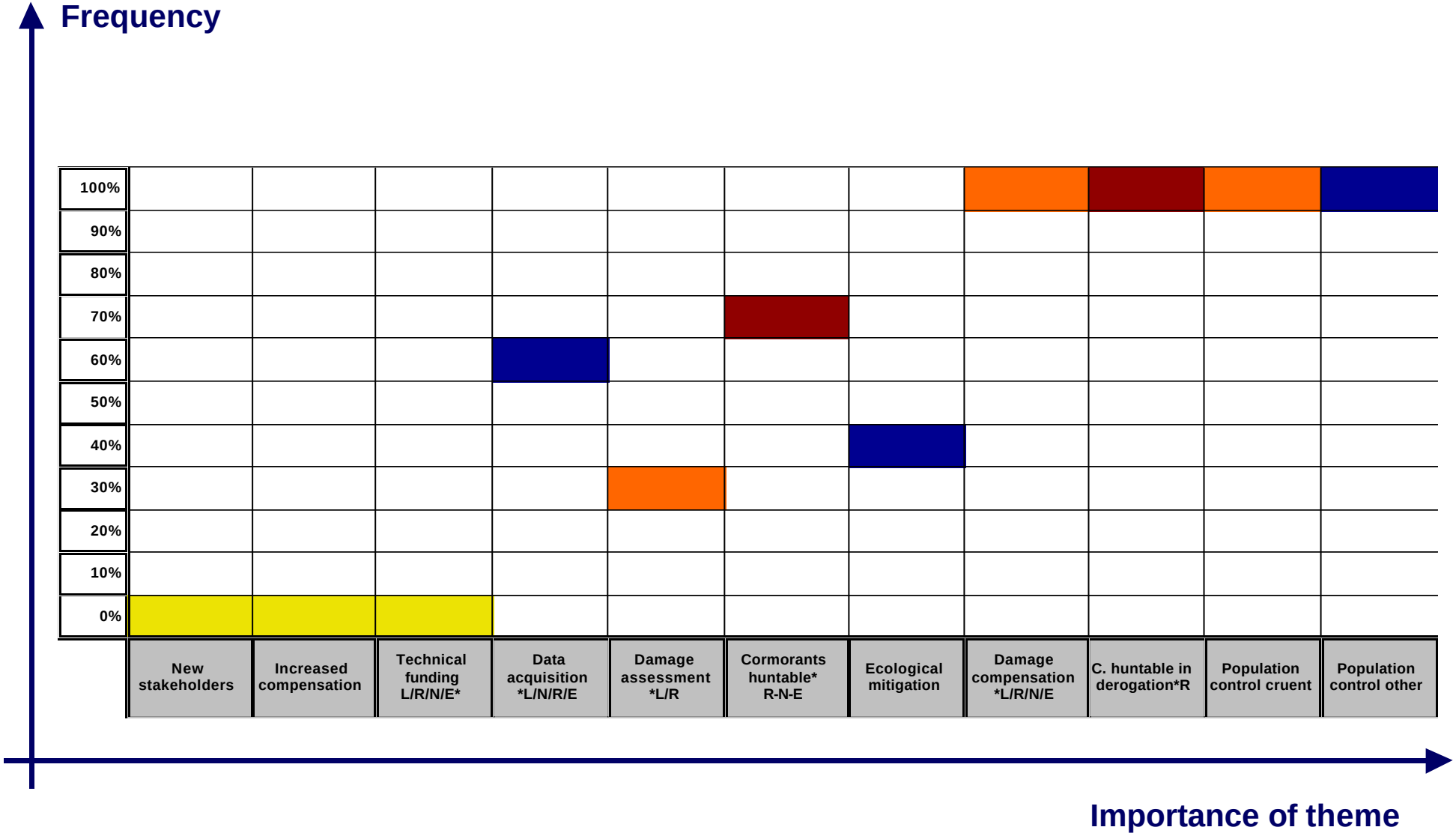
- reduction of aquaculture production importance in the protected areas (…)
- (…) including environmental tourism enhancement
- changes in current hunting regulation (species and protected areas)
- increased financial compensation for damages caused by cormorants
- increase in management level, from local (Province) to Regional, National or European
- decrease of population through hunting
- import of Best Available Practices from outside
- increase in information (data acquisition and management options)
- Wider environmental and biodiversity management issues
- General political climate favouring either side of stakeholders (or felt this way)

The following graphs express the positions of stakeholders groups over such options.

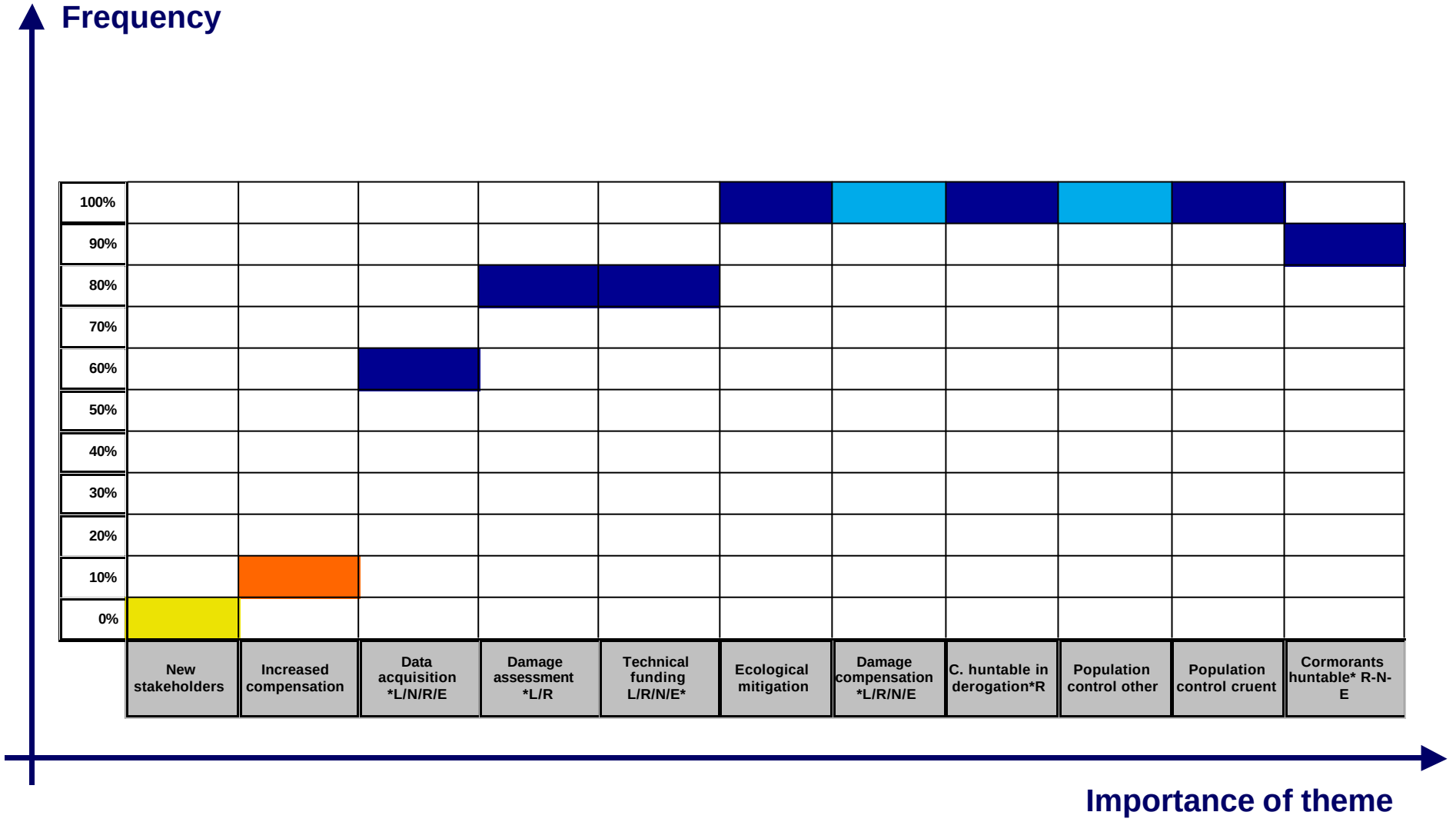
Legend: Y axis: frequency with which the discourse was made; x axis: importance attributed to management option by single stakeholder group.

Cells: express position of stakeholder group, and colour agreement with statement
Red= complete disagreement; Yellow=did not mention Orange: partial disagreement
Gray = neutral light blue= partial agreement ; Dark blue = complete agreement

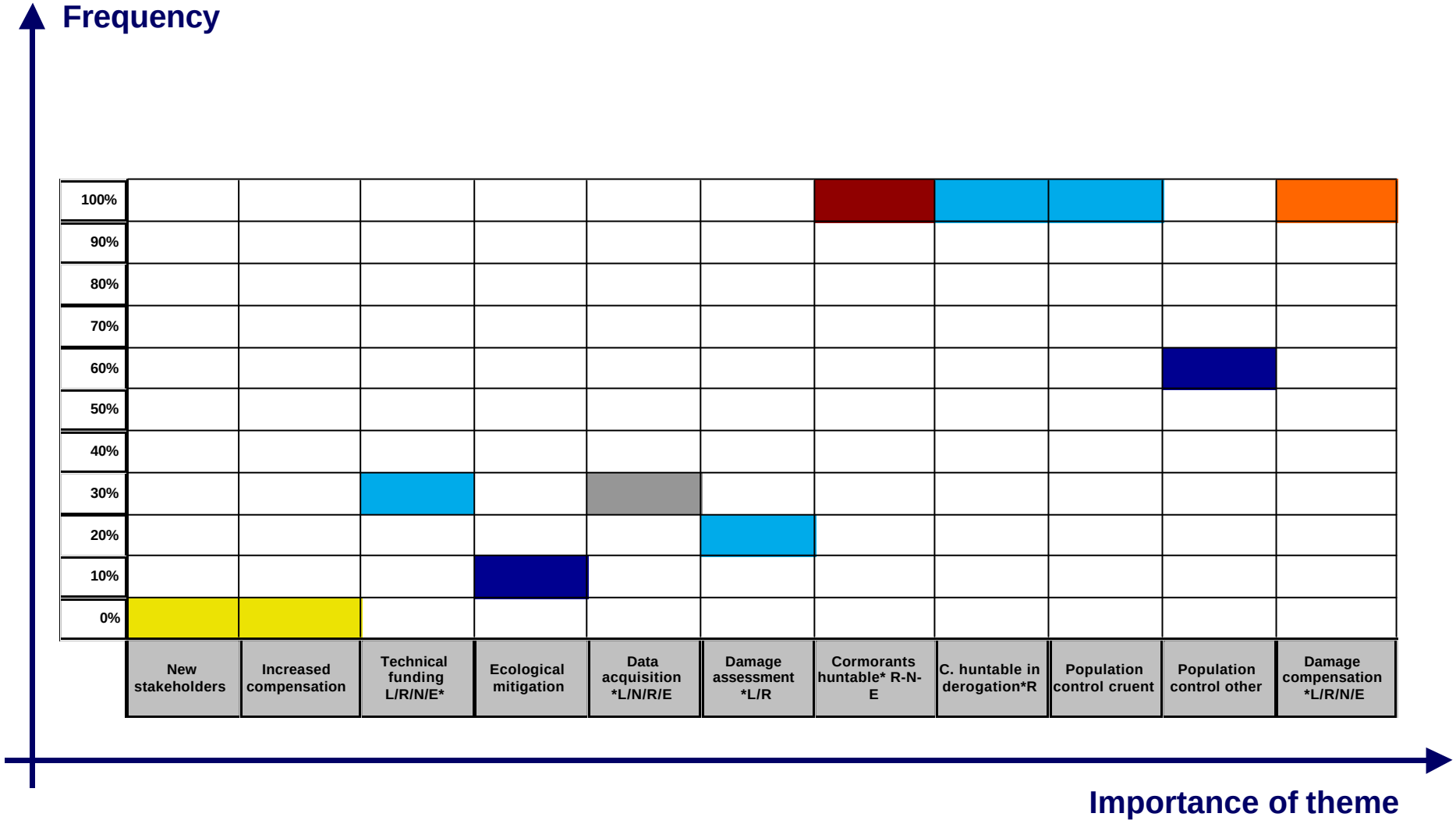
ENVIRONMENTAL ASSOCIATIONS



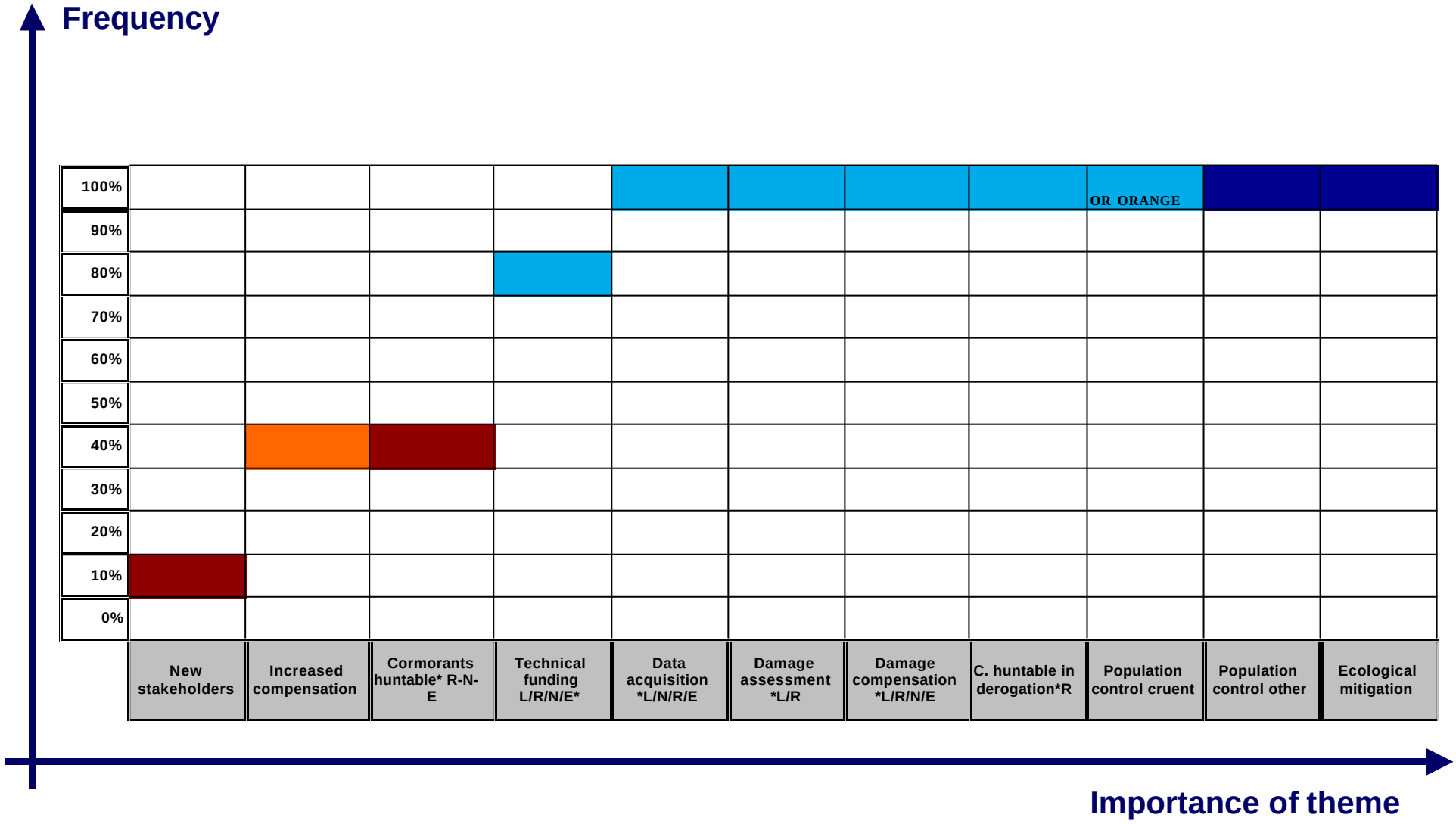
FISH – FARMERS



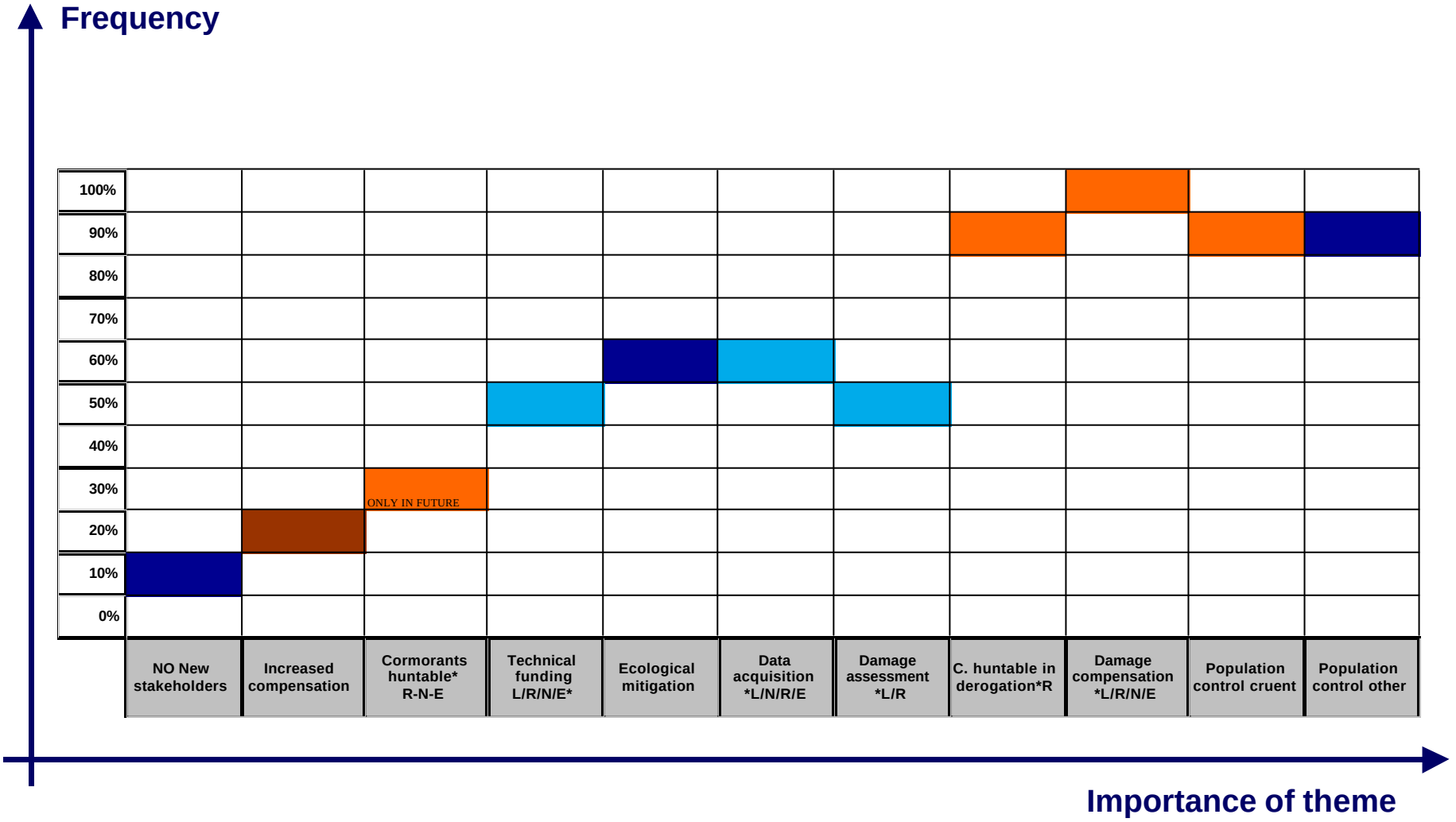
HUNTERS ASSOCIATIONS



PUBLIC ADMINISTRATORS



SYNTHESIS OF POSITIONS ON MANAGEMENT OPTIONS



5.4 Alignment of stakeholders

The following figures express in a perhaps over-simplified way the aggregations of stakeholders over management options and over illustrated storylines. Text explanation must be utilised in order to understand better what the positions are.

Table on cluster aggregation of stakeholders groups in relation to management options

Manag. Options	**NO New stakeh.**	**Increased compens.**	**Improved Data**	**Damage assessment procedure**	**Technical funding**	**Ecological mitigation**	**Damage compensation**	**Corm. Huntable in derogation**	**Population control (cruent)**	**Corm. huntable**
In favour	Others ??	Fish farmers	PA Hunters Fish farmers Envir. groups	PA Fish farmers (formally)	PA Fish farmers Envir. groups	PA Fish farmers Envir. groups	PA Fish farmers Envir. groups	Hunters Fish farmers	PA Hunters Fish farmers	Fish farmers
Against	**P.A.**	PA Hunters Envir. groups					Hunters	PA Envir. groups	Envir. groups	PA Hunters Envir. groups
Neutral	Others ??			Envir. groups	Hunters	**Hunters ?**				
Unknown position	Others ??			Hunters		**Hunters ?**				

Legend: Red= complete disagreement; Yellow=partial disagreement Gray = neutral Blue= partial agreement
Green= complete agreement NB Colours lower than neutral (disagreement) or agreement can be clustered together groups. PA = public administrators

Table on cluster aggregation of stakeholders groups in relation to storylines statements

Storylines	**Cormorants not autochtonous**	**Cor. Cause problems**	**We cannot live only of tourism**	**Damage cannot be fully refunded**	**Shooting is useless in population control**	**More information is needed**	**Cormorants are not only a local problem**
Agree	Hunters Fish farmers	Fish farmers PA Hunters	PA Hunters Fish farmers Envir. groups	PA Fish farmers (only formally) Hunters Envir. Groups	PA Envir. groups	PA Fish farmers Envir. groups	PA Fish farmers + **Hunters ?** Envir. Groups (full agreement is on the notion of "not local", not on problem)
Disagree	Envir. Groups PA	Envir. groups		Fish farmers (ask for wider damage notion)	Fish farmers Hunters		
Neutral						**Hunters ?**	
Unknown position							**Hunters ?**

5.4.1 Comparisons: Points in common, points of divergence implications for future policies

5.4.1.1 Points in common

- ?? conflict is not beneficial to anybody
- ?? information and discussion on factual information are needed
- ?? the institutions lose credibility in this situation of only partial problem solution
- ?? Birds damages are only part of a more general vertebrate protection problem, since Nutria, gulls, pheasants, and even small deer were quoted as parallel problems to the environment and to agriculture production.
- ?? Different approaches taken in other Italian or abroad increase the level of conflict by harshening the perceptions of unequal treatment in hunters, fish farmers and environmental groups

5.4.1.2 Points of divergence

First point of divergence is that cormorants are not an issue or at least not anymore since the environmental disturbance (roosting and nesting areas in Valle Bertuzzi destroyed) and killings that widely occurs . This is probably the first point in divergence: the damage is denied or seen as over-rated by some environmentalists.

On the same line but expressed from other interlocutors we have somewhat similar positions:

- ?? consideration of the wider environmental policy is needed in assessing damage or compensation and also in environmental investment overall
- ?? Cormorants are not a problem: herons are…

- ?? The second main point of divergence is if the population reduction by direct killing and the conflict mitigation strategies may or not include direct killing of the birds, although it was admitted also by environmental groups that the control of fauna populations is important in protected areas.

  Those who point out the population reduction as a potential conflict solution - some public officers but mostly aquaculture producers - ask for two very different things:
  1) making the cormorant population reduction in the local management plan authorised by INFS (National wild fauna Institute) in derogation to EU birds directive and regional legislation more substantial in terms of numbers, possibly through non cruent methods (public bodies, press and partially environmental groups if population reduction needs to be) ;
  2) Introduce the cormorant among the huntable species is what is insistently asked from the aquaculture producers also on the wake of other regions in which the administrative decentralisation has made possible to derogate to the huntable species list in the birds directive and subsequent national Italian legislation. It must be added that killing cormorants in Emilia Romagna is presently a criminal offence.

This second option is strongly opposed from some of the environmental organisations which are ready to accept only non cruel mitigation schemes mostly based on passive deterrents (nets) or ecological ones (warning cries ; air blast cannons etc). They also claim the public opinion is against a possible scenario of liberalisation of hunting of such species also on the ground of ethical views (the killing of animals).

However some understand that population control of some species such as those that are introduced, or more flexible and opportunistic, may be necessary for the preservation of rarer and more significant scientifically species. This is the case for example of deers populations in the Mesola protected woods which are now being dominated by other species that have been introduced and that need to be controlled also by direct killing.

Another strong point in divergence is if the compensation should occur to a level in which it pays back 100% of the damage (as claimed by the aquaculture producers) or only a portion of it (as assessed by public institutions). This point sees mostly the aquaculture producers and the public administrations as opponents but also other groups of vested interest such as hunters and environmental groups which are concerned about how much money for environmental restoration goes into compensation funds thus being subtracted from other investments.

Following in the wake of this specific point, another point of divergence is if operating in park areas should be accepted as an inherent risk from aquaculture producers or instead some *ex ante* (pre-emption principle ?) compensation should be made available prior to damage as permanent lump sum acknowledging recognition of such damages.

5.4.1.3 Conflict mitigation alternative suggestions made during interviews that have not met specific opposition from opponents

?? Linking the hunting option permits released in pre-park areas to continuing the extensive aquaculture activity as an environmentally beneficial activity (maintenance of brackish water environments) (made by one producer).

?? Non financial compensation: compensate birds damage through increased revenues for hunting by allowing fixed capture installations, lowering the administrative threshold that is now set high for such permits. The hunting would also produce the side effect of increased disturbance although not directed at killing cormorants.

Other management options are sought by especially the Public Administration through the FRAP work in WP9 (best available practices).

5.5 Conclusions

5.5.1 Where would further knowledge be helpful

All stakeholders in various degrees and with different motivations have demonstrated an interest in information circulation as a basis for decision making.

The information that can – in our views - help in an improved RAP, should include:

1) exchange of information and Best Available Practices (in progress in FRAP in wp9). **BAPs means to us: practical, tested, focused, effective, recipe-like information provided by current successful (conflict) managers, rather than some academic Chimera.**

2) mitigation measures that proved efficient in other areas and can be imported within the present framework set-up, with a strong accent on alternative non financial compensation schemes (in progress in FRAP);

3) diet composition of cormorants in order to better assess their impact and value of intake

4) Accurate censes and **feedback from present population management plan to address its fine tuning and allow adaptive management**

5) **Increased awareness about current legal set-up and its features and limitations**

Wp 6 interviews have also shown that many "perceptions" are truly false. Among these :

- the number of wintering migrants in the area (numbers up to 40 000 were mentioned instead of the average 2700 censed)
- the amount of cormorant's food intake per day
- the impact caused by cormorants versus other bird eating species
- the distribution area of cormorants and their belonging to the local biodiversity
- the amount of money spent for compensation of cormorant damage and/or received by single producers (up to 200 000 euros for one single producer, against a maximum figure of less than 10 000)

We indeed want to put forward the position based upon these research results, that an informed decision-making process cannot be solely based on perceptions and needs that a common shared set of data is built within the stakeholders in order to make such decisions in the spirit of "agenda 21" processes.

Circulation of correct information about the listed points of erroneous perceptions, will make the core of our educational material

5.5.2 Implications for RAP

As for the local RAP work, the public authorities are interested in the kind of "decision support" that can be taken within existing legislative framework and financial resources. This is namely:

1) exchange of information and Best Available Practices;
2) mitigation measures that proved efficient in other areas and can be imported within the present framework set-up allowing adaptive management
3) participative processes founding decisions on data rather than on "perceptions"
4) Improved circulation of information.

This interest will be reflected in the wp 9 and 10 work in our model region.

Several views that were expressed during the interviews suggested to us a step-by-step approach with stakeholders – within the present legal and administrative set-up - that might improve the decision making process by making it more transparent and legitimate through their increased participation since early stages.

1) collect all factual information after the "perceptions " have been provided. Very few interlocutors were actually in the position to give such kind of information (data but also photographs or anything that would witness their expressed positions).

2) have a semi-public discussion (all stakeholders but not the general public) to present such information and scrap consequently all not solidly founded perceptions or erratic bits of unfounded information (one example: WWF responsible was convinced that in Denmark hunting cormorants was very liberally allowed and this is why cormorants populations tend to shift to our model region)

3) Bring into the discussion the findings of FRAP, for example the role of landscape features in cormorant local population, or cormorant diet actual intake, or updated levels of population and visiting rates (REDCAFE or IMEW input also needed). This can be done with the educational material provided for by FRAP.

4) If feasible, re-discuss in the institutional forum (consulta caccia) the whole issue of cormorant impact mitigation on such new basis.

Past experience in the fisheries management sector where local awareness was hindered by distorted and insufficient information have proved in a recent past to benefit from the opening of fora and discussion based on short presentations and organised as round tables in which all participant stakeholders had the word, eventually with a larger public attending but with no interventions allowed.

The feedback of such meetings made the backbone of local fisheries management planning gaining vast consensus and spurring major changes at local and regional levels and then climbing up to national levels.

In conclusion, conflict mitigation (RAP) in our model region could presently well go through a process of increasing awareness (informative material in FRAP); social validation and minor adjustments of the choices made by the public administration through the stakeholders greater involvement. This is felt to be a more credible scenario rather than a thorough change in approach, since this results from decades of delicate social compromises (At EU, national, regional and local levels) made with the stakeholders themselves, and also because many technical and financial solutions have already been deployed and their effectiveness assessed.

5.5.3 Possible lessons that can be generalised to other cases

A preliminary analysis of points of weakness and strengths in the present administrative and legal framework was conducted in WP 4 (administrative and legal framework).

We do think - and give a brief rationale for that in the following table - that many of the strengths and weaknesses could be relevant to other countries. This could be a good basis for an exchange of useful information among partners and a starting point for wp9 "Best

practices" deliverable, which may also benefit from the wp7 work on ecological mitigation effectiveness.

Other general rules can be derived from the Italian case study:

1. keep stock of conflict low by involving stakeholders in early stages. A confrontation over time exacerbates the conflict;

2. Increase awareness by spreading short information with true figures about the conflict (numbers of birds populations, amounts spent over compensation etc). They seem to be ignored and badly needed and this could well be true elsewhere

3. Again, we wish to stress - based upon the perceptions research results - that an informed decision-making process cannot be solely based on perceptions and needs that a common shared set of data is built within the stakeholders in order to make such decisions in the spirit of "agenda 21" processes.

Table of strengths and weaknesses

STRENGTHS	WEAKNESSES	RELEVANCE TO OTHER COUNTRIES/CONFLICTS
	Complexity of Italian bureaucracy and exceeding number of laws, if compared to other countries, is confirmed. Moreover the complexity of the laws *per se* is to be considered as a weak point	Conflicting/overlapping competencies hinder effective conflict management.
Decentralisation of measurement of damage and decisions on compensations to a public body – Consulta caccia - in which all stakeholders are represented. This is especially important in the consensus building needed to establish evidence in order to make compensation feasible (no evidence no pay principle)	Insufficient recognition of the role of environmental conservation performed by extensive aquaculture fish breeders Procedures of hunting planning in the Province and Park buffer areas show inconsistencies in the proposal-approval-implementation chain Absence in many cases of a "leading agency" taking final decisions in case of lack of consensus	**YES:** decentralisation is an EU trend under the principle of subsidiarity **YES** administrative inconsistencies are a constant risk when decentralisation is a recent on-going trend **YES:** the concept of a leading agency is central to the debate of environmental management and administrative decentralisation
Local permanent arena for debate is provided by the legal system (Consulta Caccia provinciale) with all stakeholders represented **All stakeholders are represented and it is a very powerful consensus making instrument extremely useful in mitigation conflict.**	Can be time consuming: the larger the number of institutions involved, the slower the consensus building process	**YES:** Permanent debate instruments are sought in environmental management as a means of participative democracy
Compensation funding and mechanism in place. It also can be used for prevention of damage. Methodologies for damage assessment are accepted by damaged stakeholders	Funding is limited. It can handle the current requests but could not cover an increased demand of compensation.	**YES**: it works to a sufficient degree of satisfaction of stakeholders (non cases in court), Could be adapted elsewhere provided the legal instruments and funding are in place.
	Uncertain competencies among different levels of administration	**YES** this is commonplace rather than an exception in decentralisation of environmental matters
Revenues from permits and fines		**YES:** earmarking of fees and

for hunting law infringement are earmarked for improved environmental management		fines could be helpful to find resources for environmental management at local level.
	Transfer of competencies without appropriate transfer of resources	**YES** this is the case for example of FIFG management for 2000-2006 in Italy. May well be the case in other countries
	Contradictions and loopholes in national vs. regional laws	**YES**: this may happen elsewhere and create management problems. The overarching EU and international laws and conventions make this point a
	The benefits of the protection of wildlife are not directly transferred to the damaged sectors. Some transfer happens with expenditure of tax revenues	**YES**: tourism revenues could partially alleviate the economic losses caused by fish eating species Fisheries-based tourism enhancement could be used as an direct – non financial - means of transferring benefits to the fisheries and aquaculture sectors.
For what regards law n. 157/92 on hunting, a good point is that the species to be protected and huntable have been listed	a weak point is that the power of the regions to change these lists in very special cases is not clear enough, so that in recent years some Regions underwent the judgment of the State Council. Moreover, the sanctions system provided by this law is very articulated and too complicated to be effective	The absence of a list of huntable species might be relevant to other countries
	Absence of some clear policies and objectives. For example a biodiversity conservation policy.	YES to some countries. The policy setting and subsequent legal system and objectives are not a commonplace procedure. Italy has derived almost all of its biodiversity instruments and objectives from international for a (EU Directives and UN Conventions)

6 PORTUGAL

6.1 Introduction

6.1.1 Description of stakeholders

6.1.1.1 Governmental

G1
Nature Reserve of the *Sado* Estuary
Two technicians from *RNES*, a biologist and an environmental engineer were interviewed. The environmental engineer is currently coordinating a LIFE project for the restoration and support of *salines*.

G2
National Republican Guard – Nature Protection Service – Setúbal Division
The Nature Protection Service (*SEPNA*) is a recently formed team in the National Republican Guard (GNR), with the aim of responding to environmental threats. There is a green telephone line established by a partnership between the MCOTA and *SEPNA*, to receive denounces from citizens.
SEPNA is organized in a central administration and regional divisions. G2 is a coordination element of the *Setúbal* Division.

G3
Palmela Municipality – Department of Environment
G3 is an environmental engineer responsible for the Department of *Palmela* municipality. His perception about the influence of *RNES* over the municipality is that this protected area is a small portion of *Palmela* and therefore, in economic terms, land is of more important than salt marsh because of the key role assumed by agriculture in the municipality.

G4
Setúbal and Sesimbra Ports Administration (APSS)
G4 is the CEO of the *Setúbal* and Sesimbra Ports Administration. This company has public capitals and he was invited to this position one year and a half ago by the Minister.
An environmental engineer, responsible for the coordination of the environmental management system of the APSS was interviewed together with G4.

> *"Q: Do you think that the lack of land use plans affects the work of the APSS?*
>
> *A: I do not think that. The Port is essential for the development of the region. If there are restrictions that impose conditions to the activities of the Port, these will have to explain why. Everything that conditions the Port is, in my view, bad."*

G5
Alcácer do Sal Municipality – Department of Environment

G5 is a biologist responsible for the Department of Environment of the *Alcácer do Sal* municipality. She developed a study about fisheries in the *Sado* Estuary before working in the municipality.

G6
National Republican Guard – Nature Protection Service
G6 is the coordinator of SEPNA at national level.

G7
Municipality of Alcácer do Sal – Department of Environment
G7 is the head coordinator of the Department of Environment for the last three years; she is also one of the founders of the Department. She has a degree in Biology and a post graduation in environmental management.

G8
IPIMAR – Aquaculture head coordinator
G8 is the head coordinator of the Aquaculture Department in IPIMAR. He is a veterinary and he has been working since 1977 in IPIMAR. He is specialist in fish pathologies.

G9
Nature Reserve of the Sado Estuary
G9 are two rangers who work in the RNES and also in the PNSA. They both have the nature rangers training course and they have been working as rangers since 1987.

G10
Gâmbia-Pontes-Alto da Guerra Parish
G10 is the president of the *Gâmbia-Pontes-Alto da Guerra* parish. He has been president of the parish for the last six years and he is also a local trader.

G11
Nature Conservation Institute (ICN) – Nature Conservation Services
G11 is the Nature Conservation Services head coordinator of ICN. She is a biologist and she has been working for nineteen years in ICN, where she has developed work on the otter characterization at national level.

G12
Fisheries and Aquaculture General Direction (DGPA) – Aquaculture Division
G12 is the head coordinator of the Aquaculture Division in DGPA. She started working there before 1974, when she was mobilized to the aquaculture section. She has a degree in industrial chemistry engineering.

6.1.1.2 Fishing Industry

P1
P1 is a big fish farmer in the *Setúbal* municipality and one of the oldest. He is very active in making the conflict with the Reserve visible and contacting different entities to make them aware of this problem.

P2

P2 is a fish farmer that owns a supposedly extensive aquaculture. He is illiterate, but talks very much about the skills he earned during a life long in his permanent work in the estuary. He claims to know more about the *Sado* estuary and doing aquaculture there than anyone else.
Some fish farmers laugh when we reference P2, pointing to him as someone that says more than he actually does. A quote from his interview:

> *"Let people work, with conditions also. Look, you cannot do this, do instead that, and provide the alternatives, what is better, but not! Nobody thinks? Have patient, this is the crib where I was born, it was my bed, it is where I had hunger, misery and lice, and my life today is a great life, but I do not like them to damage it, no, no!"*

P3
P3 are two fish farmers, one of them quite new into the activity. He bought the fish farm from the other, as the initial owner got stuck with debts after the no return funds from the European Commission ended.

P4
This fish farmer P4 is managing an extensive aquaculture. He has been a fisherman for over 20 years. This year he started farming sea bream and sea bass. He considers that fish farms have to exist, as there is no other way to live anymore.
He is running a fish farm that is borrowed by another person from the state. It has an extension of about 80 ha.

P5
P5 owns two fish farms, one in *Alcácer do Sal* and the other in *Setúbal*.

P6
This fish farmer has a graduation in Zootechnical Engineering. She is part of the staff of a fish farm company owned by 3 brothers. During her studies she has always dreamed of returning back to her homeland, *Setúbal*. Fish farming showed up as an activity that can be developed in coastal areas.
Another person from the staff of this fish farm company showed up in the middle of the interview by chance. He comes from a family with a strong connection with aquaculture in the region. Both his father and his uncle are fish farmers.

P7
Fish sales intermediary
P7 is a fish seller (intermediary); in his point of view the aquaculture has potential to grow in the *Setúbal* region. At this moment, although there is an economic crisis, his sales are two hundred tons per year.

P8
This fish farmer has the opinion that this activity does not have a big importance in Portugal.

> *"In Portugal we already produce 3 thousand tons of fish and that represents a few millions. But prostitution in Portugal has much more power than this activity."*

P9

P9 is a fish farmer with a university degree and a large knowledge of the fish farming activity around Europe (he had a traineeship in Norway). He claims to be happy that his fish farm is part of the reserve, because among other circumstances, they have minimum water quality insurance.

> *"My personal opinion is that we are happy to be in a reserve area, because we know that someone besides us is concerned with the environmental quality in the area, because it is fundamental to have a good water quality, essentially a good water quality to develop aquaculture."*

P10
P10 is a fish farmer with a degree in veterinary medicine. He established his fish farm in partnership with two other people. Of the three, he is the only one currently dedicating all his professional life to aquaculture.

6.1.1.3 Environmentalists

A1
Former environmental group
A1 is an environmentalist from the *Setúbal*. He has been more active in the past, when he founded an environmental group. This group has merged into *Quercus* and for some years A1 worked with this national environmental NGO.

A2
Delfim Project
A2 are two environmentalists/academics who work at the *Delfim* Project, which is dedicated to the studies and protection of cetaceans in the *Sado* Estuary.

A3
Quercus - environmental NGO
A3 is an environmental engineer member of the board of Quercus, the most known Portuguese environmental association. He has always lived in *Setúbal*, so he has a strong intervention in the *Sado* estuary issues.

A4
SPEA - bird conservation NGO
Hélder Costa is the president of SPEA, the biggest bird conservation NGO. They organize several birdwatching activities and other projects in the *Sado* estuary.

6.1.1.4 Other economic agents

E1
SONAE Tourism
E1 is working in the development of a major tourism resort in *Tróia*, right by the *Sado* Estuary Natural Reserve. *Tróia* Resort has a previewed investment of 350 million euros. This includes all costs ranging from environment and degraded areas restoration, badly planned and managed forests, etc.

E2
Ecotourism Company

E2 are a couple that created an ecotourism company in the *Sado* Estuary, especially dedicated to dolphin watching. She has a degree in tourism management and planning and he has been working in this sector for some time, including whalewatching activities in New Zealand and Australia. Before starting with this project in 1998, she has worked in the Natural Park of *Arrábida*, planning outdoor activities.

E3
Salt producer (also has an aquaculture)
E3 is one of the last salt producers in the *Sado* Estuary. In the last year he produced about 300 tons of salt. In the old times they used to produce around 150 000 tons of salt. Now they do not produce more than 5 000 tons, since salt prices got very low.

> *"In the first year of activity (17 years ago) I have made 3 or 4 thousand tons. That was the year when I really won money in this activity. The cost of production was 1$00 [0,005€] per ton. I have sold it all for 6 500$00 (32,5€)."*

He also owns a fish farm were he produces seabream and bass. He expects to get more than 200 thousands fishes in the end of the year.

6.1.1.5 Scientists

C1
Biologists
C1 are two biologists that are developing a study about the otters in the *Sado* estuary, including its distribution and feeding behaviour.

C2
Former technician of RNES
C2 is an environmental engineer that used to work as a technician in RNES. Since his departure, RNES has no environmental engineers. He worked into the aquaculture issues and he had direct contact with fish farmers.

C3
Former director of the Natural Park of Costa Vicentina and Sudoeste Algarvio
C3 is a biologist and he was director of the Natural Park of *Costa Vicentina* and *Sudoeste Algarvio*, where one of the most well succeeded fish farms of Portugal is implemented.

6.1.2 Historical description of conflict

In this chapter we draw a picture of the perception of the groups of stakeholders in areas of substantial agreement and disagreement in different essential aspects that were identified within the SIA.
Tables 6.1 to 6.4 sum up the main arguments for each topic we analyse in this chapter. Each argument has a three character key associated. The first character identifies the topic, the second identifies the group of stakeholders and the third is the argument number.

Table 6.1: Arguments about the conflict otter/aquaculture

C.G.1	Fish farmers' complaints about the otter are an argument to support the installation of fences.
C.P.1	Predators usually remove small fish, resulting in a smaller loss.
C.P.2	High contingents are put to prevent fish losses.

C.P.3	Otters are hunter animals and they hunt any kind of fish, but they prefer Golden Bream and Sole because those give them less fight.
C.P.4	The damage inflicted by the otter comes not only from predation to eat, but also because this species likes to have fun with the fish.
C.P.5	Total predatory losses are about 15%.
C.P.6	An otter eats 4 kg of fish a day.
C.P.7	Otter gives losses from 5000 € to 15000 € by year.
C.A.1	There is no conflict, fish farmers say that by ignorance.
C.A.2	An otter weights 7-8 kg; she cannot eat 4 kg a day.

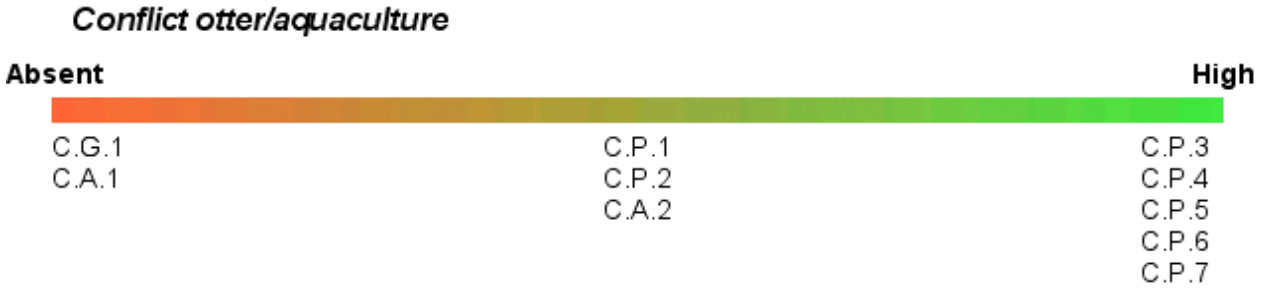


Figure 6.1: Perceived conflict between the otter predation and aquaculture

Most of the stakeholders have the perception that the conflict between otter and fish farming exists, resulting in the killing of some of these animals by fish farmers. Fish farmers refer that this conflict only exists because they are not allowed to implement some mitigation measures like fences. Some fish farmers even refer that an otter is able to eat 4 kg of fish per day, representing a cost of 20€/day. The losses of value presented by fish farmers are not very different from each others (around 15%). Some stakeholders (governmental and environmental) classify these costs as being wrong and over calculated.

There is a clear separation between the stakeholders groups concerning the perception of the conflict between otters and aquaculture. Among the arguments that support that the conflict is high, there are only fish farmer's arguments, while only government's and environmentalist's arguments stand to the fact that there is no conflict.

Table 6.2: Arguments about the reserve management

R.G.1	Activity is being halted by the *RNES* policy on aquacultures, resulting in a growth of illegal fish farms.
R.P.1	"If we work legally, the men do not earn for the light" with the low fish densities limit imposed by the *RNES* (350 g/m3).
R.P.2	Project proposals are also continuously blocked by the administration of the Reserve which does not present any explanation to fish farmers.
R.P.3	Dialogue has become impossible.
R.P.4	Even after fish farms are built, the Reserve imposes severe restrictions on the building of infrastructures, some of them essential for the activity.
R.P.5	Comparing with other protected areas in Portugal this situation is unfair.
R.P.6	The Reserve does not want to listen to anything.
R.P.7	Some fish farmers keep good relationships with the Reserve.
R.P.8	The declarations of the Reserve on the impact of aquacultures on birds are not supported by any data.

R.P.9	*RNES* is against fences around fish farmer's properties, so fish farmers have to kill the otters to protect their properties.
R.P.10	The Reserve sometimes puts obstacles with no foundation (...) depending on the humour/state of mind.
R.A.1	Fish farmers do not pay an ecological tax to operate inside the Reserve.
R.E.1	It does not make sense that the Reserve stops the fish farmers from installing fences, opening the ground to killings.

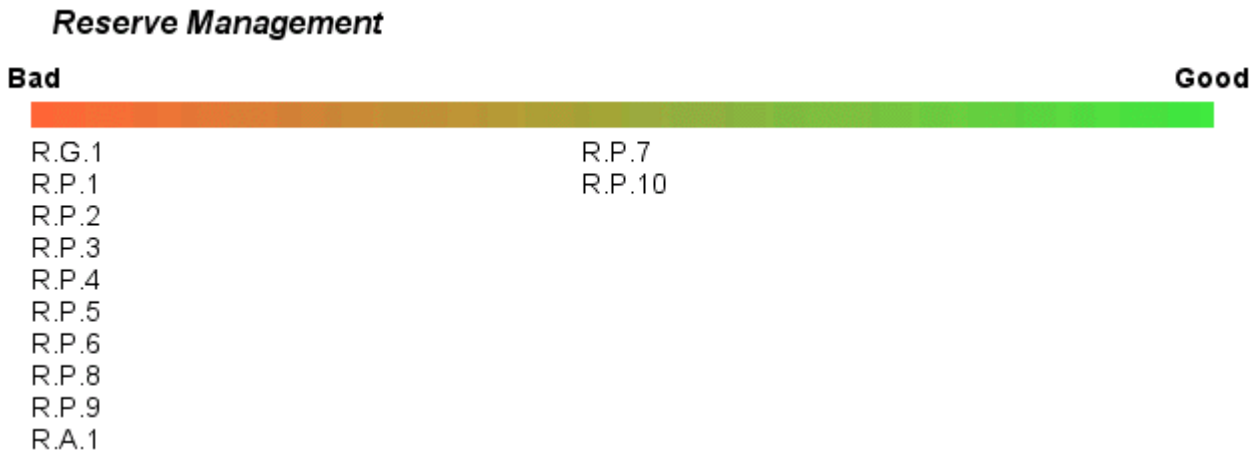


Figure 6.2: Evaluation of the Reserve management

Almost all the fish farmers share the opinion that the actual procedures in the management of the reserve are not good mentioning that the actual directive commission of *RNES* is against this activity.

Figure 6.2 shows an almost absolute consensus in what concerns the Reserve management: except for two arguments that classify the reserve management as average, all the arguments stand for that the Reserve does a bad management. This opinion is also shared by environmentalists and governmental stakeholders, even though for substantially different reasons. The only exception comes from a fish farmer that belongs to a recently formed aquaculture association, who has a good relation with the *RNES*.

Most of the fish farmers state that the *RNES* has a lack of technical resources thus affecting the management effectiveness of the reserve.

Table 6.3: Arguments about the environmental and socio-economic benefits

S.G.1	The market is saturated with fish
S.G.2	Aquaculture has a low importance when compared with the other economic activities in the region, such as industry, agriculture or traditional fishing.
S.G.3	*Sado* estuary is a productive and sheltered area for aquaculture.
S.G.4	Aquaculture has a potential to employ non qualified labour in an area that suffers from big unemployment rates.
S.P.1	Aquaculture is a promising solution for the deficit between the fish captured and the fish that Portuguese people eat.
S.P.2	If the density limit in the *RNES* is raised and more area is authorized for aquaculture, huge economic benefits will be derived.
S.P.3	Aquaculture is the only viable alternative to the old ponds of salt production, increasingly abandoned as a result of the market devaluation of salt.
S.P.4	Fish produced in *Sado*'s fish farms is of higher quality.

S.P.5	Fish losses in aquaculture increase the fish stocks in the estuary.
S.P.6	Aquaculture employs some local people, but it has a very strong potential if increases in production, both in density and in area, are authorized.
S.P.7	Besides employing local people, aquacultures can absorb young people with some level of specialization.
S.P.8	Local employment associated with the activity does not have a big importance.
S.P.9	When the ponds are not maintained, they are quickly overtaken by "Gramata" a bush that grows very quickly in salty and moist soils. It is not good for birds and it kills fish. Fish farms prevent this from happening.
S.A.1	The estuary has a big economic potential and aquaculture is one of the activities that could foster this potential.
S.A.2	Besides the environmental impacts, aquaculture is destroying the artisanal fisheries sector.
S.A.3	There is a major incompatibility between ecological tourism and economic activities like aquaculture or industries.
S.A.4	There are huge ecological costs in this activity that are not included in conventional cost-benefit analysis of this activity.
S.E.1	Fish farming is more profitable than salt production.
S.E.2	The price of fish is decreasing.
S.E.3	Aquaculture is positive because it generates jobs.
S.E.4	The conversion of *salines* to fish farms harms the ecological tourism in the region

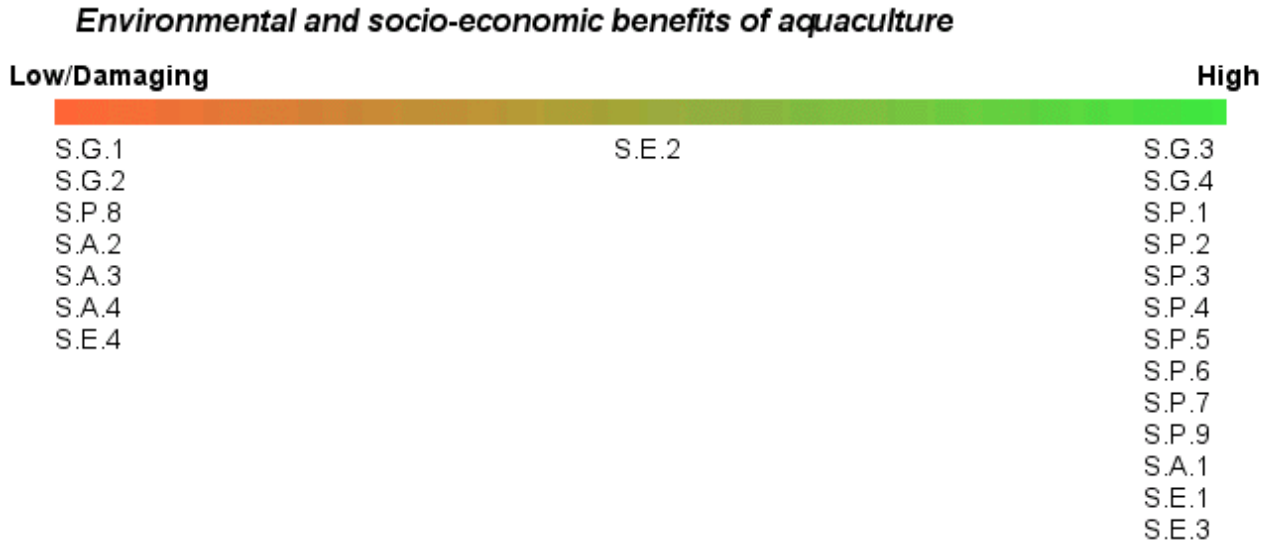


Figure 6.3: Perceived environmental and socio-economic benefits of aquaculture

Except for one argument from a fish farmer that stands for the low benefits of aquaculture, all other fish farmer's arguments exalt the virtues of fish farming. However, several stakeholders on other groups classify the benefits of aquaculture low or that aquaculture is damaging to the environment.

It is important to note that some of the socio-economic benefits will only be achieved on a medium or long term time scale.

> *"It is expected that around year 2050, more than 50% of what we eat comes from aquaculture. So this activity is a strategic activity for the XXI century." --P8*

The main benefit attributed by the interviewees to the aquaculture is the generation of jobs in an area where the unemployment is high and the educational level is low. Another benefit is also the fulfilment of a gap in the market fish in terms of some species like sea bream.

Table 6.4: Arguments about the benefits of the otter conservation

O.G.1	Otter has a conservation value per se.
O.G.2	The potential for tourism based on conservation is a benefit of the presence of otters.
O.G.3	The otter is used in environmental interpretation programs by schools and this further increases its' value as a species to be preserved.
O.P.1	It is a pleasure to look at otters.
O.A.1	Having an otter in the area is a great richness.
O.E.1	Vertebrates, apart from the dolphins, do not significantly benefit the ecological tourism in the area. However, with the development of the tourism in this area, they might get their role.

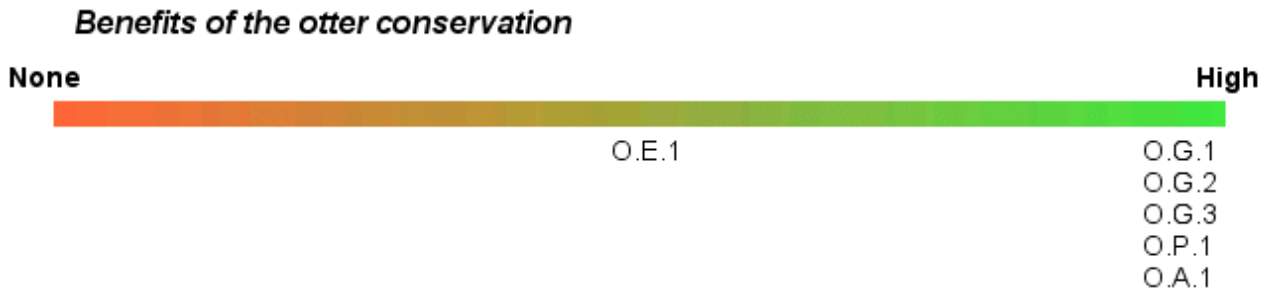


Figure 6.4 - Perceived benefits of the otter conservation

Several stakeholders did not refer anything about the benefits of the otter conservation. The ones that did it have a positive opinion about the conservation of this animal saying that it is a very pretty animal. Some of them are even convinced that the aquacultures contributed to expansion of this species.

Except for one argument from an Economic agent that places the benefits of the otter conservation between low and high, all the other stakeholders arguments, mainly from governmental stakeholders, stand for that the benefit of the otter conservation is high, even one fish farmer's argument.

6.1.3 Description of existing mitigation measures/management plans

The following tables sum up the mitigation measures pointed out during the stakeholders' interviews, including a qualitative assessment of its effectiveness.

Table 6.5: Mitigation measures suggested for the conflict with the otters

Mitigation measures	E2	E3	G1	G6	P1	P2	P3	P4	P5	P7	P8	P9
Fences around fish pounds (for otters)	G	B	B	G	G	B	G	G	G	G	G	B
Electric fences around fish pounds (for otters)	G	B	B		G	B	G	G	G	G	G	G

Mitigation measures	E2	E3	G1	G6	P1	P2	P3	P4	P5	P7	P8	P9
To include more fish in the ponds, counting with animal predation							A					
State sponsoring to implement mitigation measures								G				
The creation of a local commission to study the conflict and the application of mitigation measures								G				
Payment to compensate fish losses								A				B
To feed otters with fish with no economic value								G				
Dogs in the property											G	

G – good ; A – average ; B – bad

According to P4 and P9, paying for the losses would not be viable, because it would basically be impossible to assess how much predation has been caused by otter or cormorants. Still, it would be better than doing nothing related to this.

Some fish farmers have pointed out that even the widely used conventional and electric fences, are not effective, because the animal quickly gets used to the obstacle and finds ways to get over it. Despite that, most fish farmers want to install fences around their fish farm and some of them even did it already, though there is a Reserve prohibition. Several fish farms refer to the use of fences in other areas of aquaculture as an innocuous device to the otters, and a positive measure to the business.

Table 6.6: Mitigation measures suggested for the conflict with birds

Mitigation measures	E3	P1	P2	P3	P4	P6	P8	P9
Nets/wires over fish ponds for cormorant	B	G	B			A		G
Gunshots				B	G			
Gas shots				B		B	A	
Scarecrow for egrets					G			
To design the ponds orientated to the dominant winds (for cormorants)								G
To design the ponds with higher scopes (for egret)								G

Mitigation measures	E3	P1	P2	P3	P4	P6	P8	P9
Imposition by the Reserve of a fraction of non-productive area in the fish farm for birdlife						B	A	

Nets or wires over the fish ponds, to protect the attack of cormorants, are considered by some fish farmers as being ineffective, as the birds get used to it and find a way around it. This opinion is not shared by all the interviewed stakeholders. Some of them point out the effectiveness of this measure, while complaining that the Reserve does not allow them to use it. The same happens with gunshots and gas shots, even though they still have a widespread use.

In some cases, the Reserve has demanded to some newly installed fish farms, the allocation of a fraction of its area to birdlife. This measure is not well seen by the affected fish farmers, who complain that the area demanded is way above the reasonable, especially in smaller fish farms.

Table 6.7: Mitigation measures suggested for the conflict with the Reserve

Mitigation measures	G1	G2	G6	P5	P6
Land Management Plan for the *RNES*	G				
Improvement of technical means for supervision purposes		G	G		
Joining efforts among the responsible entities to conserve nature		G			
Improvement of communication between fish farmers and *RNES* direction				G	G

Lack of communication between fish farmers and *RNES* is a major blocker for the application of most mitigation measures and further deepens the conflict with the otter. Almost all fish farmers pointed out this situation and some of them have a clear perception that establishing communication between both sides would be a very good help for the minimisation of the conflict.

Table 6.8: Other suggested mitigation measures

Mitigation measures	A1	E3	P1	P3	P4
Raising awareness of fish farmers	G		G		
To use analytical equipment to ensure better quality in the *Sado* Estuary.				G	
Installation of gates to avoid people circulation					A

To forbade rice fields at no more than 30 km from the sea	G
State support to salt production	G

Other mitigation measures include the support for salt production. This activity is almost considered a sanctuary for birdlife and both the Reserve and municipalities are actively involved in projects to recover *salines*. However, some fish farmers consider that there are no conditions for its implementation due to the lack of know how – most of the ones knowing this craft are old or gone – and to the low market price when compared to the required investment.

> *"Only old men used to produce salt and now they are all dead. Young people do not want to produce salt because it is not profitable. In Algarve it is easier to produce salt because of the land that is more compact."…"The only salt producer in this area still have six year salt do sell."--P5*

A lack of awareness concerning nature conservation is patent amongst most fish farmers. This was both stated by an environmentalist (A1) and a fish farmer itself (P1).

6.1.4 Description of the story lines

6.1.4.1 Quality of fish produced in the *Sado* estuary should be promoted

Fish produced in the Sado Estuary has very good quality (F) and that added value should be promoted near the consumer (V), increasing the profit margins (I).

G1 shares the **value** expressed above that the fish quality should be promoted, even though it makes no mention about the actual quality of the fish produced. They mention the importance of quality while pointing at the lack of profitability of the fish sector and the dependence on public funding, therefore getting close to the **interest** of fish farmers. This concern results from the hope that an increased investment in fish quality will lead to bigger environmental concerns from the side of fish farmers.

P1 is one of the fish farmers which defend the quality of fish from aquaculture (**fact**), pointing out that this is highly dependent on the technology and management practices applied. In the *Sado* estuary, fish farms are done in semi-natural areas (old *salines*) where fish gets a big amount of natural food, raising its quality. Fish from Portugal has an overall good quality and this leads to its' selling prices being higher than imported fish. Even though, he points out to the need of a campaign which shows that the Portuguese fish has a higher quality than other imported fish in the market (**value**).

P2 also points to the relation between bad management and fish quality. To him, intensification of fish farming is the main problem and the fish he produces in the *Sado* estuary is of the highest quality (**fact**). He doesn't state an explicit **interest** in increasing profit margins.

P3 and P4 share the same opinion about the **fact** that fish quality in the Estuary is higher than imported fish, due to a lower intensification of the production. P4, owner of a (supposedly) extensive fish farm states that a promotion of the **value** of quality. He does state, however, that it is possible to have intensification with good quality as long as there are good management practices; on the other hand, he recognizes the **fact** that fish from aquaculture is never as good as fish from nature.

G7 is very much into the promotion of quality of fish for gastronomical ends therefore agreeing with the given **value**. Speaking about fish from aquaculture, she only states the difference between fish from aquaculture and from the sea. She disagrees with the **fact** that quality is better on aquacultures from the *Sado* estuary, by comparing fish from aquaculture with poultry farming.
P6 does not focus on the **fact** of fish quality. They seem to have a bigger concern with global productivity, so that they can compete with the prices of fish coming from other countries. P5 further develops this concern, stating that people have no purchasing power and implicitly saying that the **value** of fish quality will not make a big difference. He states, however, that fish quality of imported fish is, in **fact**, very low compared to national fish, especially because of the long travel times.
P10 is very clear on defending the **fact** that the quality of fish is very high and that fish from aquaculture is better than any other because it's a fast growing fish that does not accumulate heavy metals or other chemicals. He is very much into pushing up this added **value** of fish quality by creating a brand that distinguishes the fish that comes from the *Sado* aquacultures from other fish. He also notes that offshore aquaculture cannot have the same quality as "esteiro" aquaculture, comparing it to poultry farms. He then attacks the sell offs of food, arguing that this happens when a very bad quality product comes to Portugal. The consumers follow these sales and there is a clash with the **interest** of fish farmers in increasing the profit margins. P10 defends that this profit can be increased not only through the inherent fish quality, but also by implementing the processing of fish.
P7 states that the **value** of fish quality is not important to consumers – they will always buy the cheapest and it's very difficult to make it look different from the normal fish. The **interest** of increasing profits has to be safeguarded with an increase of the production. However, he agrees with the **fact** that fish quality in the *Sado* estuary beats that of any other place in Portugal. An important point he focus on is that a packaging facility, defended by several fish farmers, will lower the quality of fish as it will take longer to be killed and arrive in the market, losing freshness. Also, he disagrees with the **fact** that fish quality from intensive aquaculture is of lower quality than the extensive.
E3 promotes the quality of fish from aquaculture, stating that it is in **fact** a fatter fish and therefore, much tastier.
G4 also believes that quality overcomes quantity in the *Sado* Estuary. He agrees with the **fact** that fish quality is much higher than the imported fish, which can't be eaten at all. This stakeholder feels this **value** could be promoted.
P8 is firm in pointing out the **fact** that Portugal has great conditions to produce fish with quality from the viewpoint of taste, unlike countries like Greece.
G8 focuses on the **fact** that the quality of fish entering our market from Greece or Turkey is extremely poor, because it's the remaining of what can't get into other European markets. He does not focus directly on the need to make use of the **value** of fish quality to increase profits, but he implicitly does so by stating that aquaculture in earth tanks cannot jump to very intensive numbers, as it will put the system itself in risk.
The C1 also speak about the quality of the product, but they do so by saying that some, and not all, fish farmers can in **fact** have a good fish quality. This can be achieved by allowing the fish to get a bigger amount of natural food. One of the C1 then goes on to make a statement expressing a full belief on the **fact** that fish from national aquacultures has a better quality than those coming from international markets. Both seem to agree that there is an added **value** in promoting fish quality, a work that could be done together by the fish farmers and the Natural Reserves.

P9 believes our country does not have the natural conditions to go into intensive production. He agrees with the **fact** that fish in *Sado* has good quality and that it should be promoted (**value**) in the **interest** of increasing profit margins.
A3 does not agree on the **fact** that fish from the *Sado* aquacultures is better than imported fish. He states that he couldn't know the difference between the fishes. On the other hand, he only believes that aquaculture can be compatible with his **interest** of nature conservation if it is more extensive.
G9 don't make statements about the quality of the fish from aquaculture. However, they point out to some badly managed fish farms, where all kinds of waste, including some dangerous waste, are used for the tank walls. They say that this can affect the (**fact**) quality of fish.
C2 strongly stresses the **fact** that aquacultures benefit from a higher water, and consequently fisher quality from being in a protected area. This **value** should be promoted through a certification scheme in order to increase the (**interest**) profit margins and surpass the competition from the intensively produced fish coming from Greece, Spain and Morocco.
G10 has no doubt about the **fact** that fish quality in the *Sado* estuary is much bigger than the one coming from Greece or Turkey.
G12 agrees with the **fact** that the quality of fish coming from Turkey or Greece is lower than our aquaculture fish. She goes on to say that quality promotion starts to be an important **value**, but it still has to go on with a quantity increase. This effort should come with a promotion of quality certification, taking out the image of "poultry farm fish".
Without specifically arguing about the **fact** of fish quality, C3 speaks about the importance of a certification when asked about a possible bet in fish quality. He says that this could reduce the impact of fish farms on the environment and, at the same time, create an added **value**, therefore increasing profit margins.

6.1.4.2 There is misunderstanding between fish farmers and the Reserve

The lack of understanding between fish farmers and the Reserve (V) is a result of the lack of dialog from the side of the Reserve (F) and intensifies the conflicts with nature conservation (I).

G1 expressed the difficulty of the Reserve in replying to the fish farmers, so they effectively agree with the **value** that there is lack of understanding between the two sides. They believe the initiative should come from the side of a fish farmers association that they could form together, so they disagree on the **fact** that this conflict is their own fault.
A1 believes that the reserve should work to raise awareness among fish farmers. In **fact**, this work does not exist now and what happens is that the Reserve licenses the fish farmers and gets in conflict with them (**interest**), which is something that cannot happen.
P1 does not fully agree with the **fact** that there is no dialog – he says that there have always been negotiations, but the result has been null. In the past, under a different management of the Nature Conservation Institute, there has been a bigger understanding and communication between the fish farmers and the Reserve, which means the agreement with this **value** and **fact** is specific to the current administration/policies. There is also evidence that the conflict basis is the Reserve and not with the **interest** of nature conservation itself, as he expresses when he states that some ICN administrators have been misinformed by the RNES technicians and administration.
P2 states the **fact** that the Reserve administration does not want to talk to him, despite his several attempts. This has leaded him to disobey the rules and proceed his work attempting against the **interest** of nature conservation.
The same idea about the **fact** is expressed by P4, who has been fined without being able to talk to anyone. He says that this understanding would be a very important **value** and would allow the peaceful coexistence of both fish farmers and otters. On the other hand, he seems to

be willing to take action to block the entrance of RNES people in his property, further contributing to this (**fact**) lack of dialog and not helping the understanding between the two parts (**value**) in order to protect his **interests**.
P5 points out the Reserve as the blocker concerning the licensing of fish farms, saying that they don't listen (**fact**) to any arguments they present and even contradict themselves. He says that this misunderstanding (**value**) comes from their interest in protecting birds and otter by producing salt, something which he's not able to work on (**interest**). P5 also states that fish farmers are defenders of the environment and that RNES needs to dialog with them.
P10 defends that fish farmers have the biggest **interest** in maintaining the water quality and that the Reserve does not understand this and argues against without presenting any sources (**value**). There an apparent clash of **interests**, but the **fact** that there is no dialog leads to no solutions being drawn together concerning the management of the fish farms. The Reserve does not have a constructive attitude of cooperation, which is something that would be expected in any civilized country. However, their aquaculture has been approved by the reserve, and there are some "very verbal" contacts between them and RNES. He goes on to say that the Reserve should be held accountable for their attitude that clashes with the **interest** of the national economy, by plainly forbidding everything.
E3 has a good relationship with the Reserve, disagreeing about the exposed **fact**.
P8 refers that APPA is part of the Reserve, as an observer, so there is at least (**fact**) the formal structure for dialog. This has worked under previous managements, where there were actually meetings, but under the current management, these meetings (**fact**) seem to have ended, leading to no possible negotiation with the Reserve. He says that there is an association of two or three individuals which claims to dialog and have good relationships with the Reserve. The Reserve director has publicly used these relationships to reply to an attack. However, he states, this has no **value** for the understanding because there are no results from these talks.
G5 points out that the Reserve should discuss more and say less no before anything, implying an agreement with the above mentioned **fact** and **value**.
E2 is a strong criticizer of RNES work. He says that the reserve encloses itself and (**fact**) doesn't dialog with anyone. Instead of this isolated attitude, everyone should start working together for the common **interest** of nature conservation.
P6 also pushes strongly against the Reserve, denoting the (**value**) lack of understanding of the two sides. He states an **interest** in nature conservation, but at the same time he criticizes the Reserve for always putting the birds in first place. There's no mention about the dialog between the two parts, but he has referred an unfruitful search for books about bird life in the Reserve.
C1 have expressed a big concern with the **fact** that there is no dialog between the Reserve and the fish farmers and how this leads to a lack of understanding (**value**) between them. To protect the otter and other predators (**interest**), a work of awareness rising among the fish farmers concerning this species needs to be done. The restrictions unilaterally imposed by the Reserve are putting people against the otter. In the end, it's the otter that pays for this conflict and lack of understanding and comprehension from both sides.
P9 complains about some restrictions arbitrarily imposed by the Reserve on the aquaculture activity (**value**), but points out to existing dialog and regular meetings between the Reserve and his fish farming association, Anaqua. There is in **fact** ongoing work with the Reserve to create a regulation for aquaculture and the relationship between the two sides is good. He also speaks about the **interest** fish farmers have with the environment, especially concerning the water quality. This leads him to recognize the importance of the protected area for the activity.
G9 say that the problems or the work of RNES are not publicized and that people have no idea of what they are doing. Though not directly related to the lack of dialog between fish

farmers and the Reserve (**fact**), this shows an enclosure like attitude pattern on the side of the Reserve that is criticized by several stakeholders. They share the mentioned **value**, by recognizing that they and the fish farmers are always in opposite sides. Regarding the **fact**, they also criticize the fish farmers for not sharing information with the Reserve, so that the activity can be controlled, for example regarding fish densities.
A4 does not talk about this misunderstanding, but states that conflicts like the ones with the cormorants can be solved as long as there is will.
C2 thinks that the conflict will continue escalating and the positions of both sides extremed (**value**), unless the administration makes an effort to start the discussion (**fact**). There is a strong field for cooperation between the two sides, as fish farmers could use the argument of having a good water quality in the Estuary (**interest**) to promote their fish.
G10 denotes the lack of comprehension the Reserve attitude has created within the population towards the protected area (**value**), by imposing strict rules without giving anything back.
G12 speaks about the lack of communication inside and between governmental institutions, especially the Nature Conservation Institute, giving the idea that this lack of dialog or communication (**fact**) is a wider problem and not specific from the Reserve administration.

6.1.4.3 The Reserve escalates the conflict

RNES powers the conflict (V) by creating obstacles (F) to the development of aquaculture (I).
G1 does not seem to agree with the **fact** that they are creating obstacles to aquaculture, as they speak about the system failures that lead to problems with fish farm licensing. This leads to them disagreeing with the stated **value** that they are behind the escalation of the conflict.
A1 says that the Reserve cannot simply license the fish farms and enter into conflict (**value**, **fact**). There has to be a continuous work on awareness rising, with teams visiting aquacultures regularly.
P1 has a strong feeling against the public administration in general which is full of bureaucracy. Regarding the **fact** that the Reserve is creating obstacles to fish farming (**interest**) and thus powering the conflict (**value**), he points out to the prohibition of applying mitigation measures for predators, like fences. Fish farmers suffer high economic losses from predators like the otter and, because they can't defend themselves, they kill them whenever they have the opportunity. In his opinion, the Reserve has an anti-economic attitude and tries to find every pretext not to give permits to fish farms – they simply say no without presenting reasons. This situation has worsened in the last two years. Recently, he has disagreed with an imposition of the Reserve to do a work in his fish farm as a mitigation measure. He states that he would do it if they could explain to him that it was good for nature, because he's also a nature lover. He feels they didn't do it and so he refuses to go ahead with the work.
In the same position of P1 come the arguments of P2. He strongly criticizes the obstacles created by the Reserve (**fact**) to the development of his activity (**interest**). He considers his knowledge about the *Sado* river to be bigger and more important than what the Reserve director acquired in some "badly given lecture". He doesn't remember any period where the Reserve has had a better attitude.
P3 speaks about the strong bureaucracy involved in aquaculture processes, which has even lead to some past projects being abandoned for losing economic viability (**interest**). He points out to a case where the Reserve acts against the regulations of other governmental institutions, like the Fisheries Directorate-General, by creating an obstacle (**fact**) to the installation of a packaging room. He says it would be impossible to do such a building outside the Reserve area, because it needs to be close to where the fish is caught. These obstacles are clearly mining the relationships between the Reserve and this stakeholder (**value**).
A2 is very much against the development of aquaculture (**interest**) in the *Sado* estuary. He says that fish farmers want to put their infrastructures inside the Reserve because the cost of

land is lower. Therefore, he seems to think that it is the fish farmers who should be held accountable for the conflict (**value**).
P4's discourse shows a long list of complaints about the way the Reserve is creating obstacles to his activity (**fact**). He was blocked and fined by the Reserve when he was trying to build a small hut for his workers. He says that the Reserve does not want intensive fish farming, but then goes on to block everything he does in his extensive aquaculture, harming the development of the activity (**fact**). He feels completely powerless, not knowing who to speak with. Like P3, he also says that there is a conflict between what other governmental institutions demand or allow for fish farms and what the Reserve forbids. This prohibition from the Reserve has escalated the conflict in such a way (**value**) that he threats blocking the entrance of the Reserve staff in his fish farm.
G7 speaks about the conflict between fish farmers and the Reserve, stating that there is a clear conflict of interests between bird conservation and aquaculture development. This has lead to a situation where fish farmers have come to the municipality complaining that they are being chased by the Reserve (**fact**). At some point, there was a misunderstanding between P1 and the municipality, which has lead him to accuse the municipality of boycotting his activity – G7 asked him if he thought that due to the bad relationships he has with the Reserve. This last thought seems to show an agreement with the **value** that RNES is currently powering the conflict.
E2 says that the Reserve is blocking efforts from the fish farmers to reduce the conflict (**fact**, **value**). They forbid fish farmers from putting fences after they have allowed the installation of aquacultures.
P6 say the Reserve is constantly raising problems on their fish farm (**fact**), despite the care they have in complying with the rules. This makes them go angry in the speech, to the point where one says that "if they want more space to birds, they should buy it" and that this complicated situation could only be solved "with shots" (**value**). They also say that this situation is typical of the *Sado* Reserve and that it doesn't happen in other parts of the country, like Algarve, where fish farmers have enough power to oppose the Reserve.
P5 says the Reserve is always on them "like wolves". They are constantly creating problems with the licensing of fish farms (**fact**), even though he has an extensive aquaculture. He says that what happens is that they are against aquaculture (**interest**) and only want the *salines*, which is an activity he doesn't have the knowledge to work on. He says that this situation could be improved if the Reserve had some openness to the activity (**value**) and promote meetings with the fish farmers, where both sides could work for consensus. However, he thinks that the Reserve is convinced that aquaculture will end, so they are constantly trying to demoralize the current producers – which will not give up, since they have already invested big amounts of money.
P10 feels that the Reserve acts strongly against fish farmers (**value**, **fact**), especially because it is "full of environmentalists", instead of common people. He accuses the Reserve of being commanded by a former director, Dr. Antunes Dias, which has always been against aquaculture. He thinks that the Reserve has no reasons to oppose fish farmers, as they are the first ones to suffer with pollution and to point out to problematic situations. The development of aquaculture (**interest**) is constantly pushed back by the Reserve. He points out that this is the opposite of the situation in countries like Spain or France, where there is a strong support to the activity. The conflict has such a dimension that he says that natural parks should be put where they don't create a barrier to the development of economic activities. He doesn't know what could be done to solve this conflict – the hatred has become too deep, so maybe only with a complete change of the people in the Reserve, as they no longer believe in them.
P7 agrees with the **fact** that the Reserve creates obstacles to the fish farmers, who complain a lot about the situation. He believes that this is the biggest conflict fish farmers have and the

fault comes from the side of RNES (**value**). If they allowed the installation of fish farms, they now have to let them work.
E3 speaks about some obstacles created by the Reserve, but feels that they are not out of order (**fact**). He seems to get special treatment, since he states that he has an house inside his fish farm and didn't take a license for it – the Reserve never raised an issue on that. He never had problems with the Reserve (**value**) and he says that people should comply with the rules, just like they do when driving on the road. As a fish farmer, he feels the activity has an **interest** and that the Reserve will perceive it in a near future.
G4 only says that fish farms exist and have been licensed, so he doesn't have a feeling that there are big obstacles being imposed by the Reserve (**fact**).
P8 says that aquaculture is developing (**interest**) despite the efforts of the administration and people from the environment. Like P10, he points out that who issues positions in the Nature Conservation Institute are environmentalists. The Reserve has been an obstacle to the activity (**fact**). He attacks the Reserve saying that it is illegal, because it's an Installation Committee for 20 years, without ever electing a board. In line with P10' speech, he attacks the former Reserve director, Dr. Antunes Dias, who has an hatred towards aquaculture. He has also seen blocked the building of infrastructure that he believes to be necessary to comply with the law and says that only in some cases – where the boundaries are close enough – it would be possible to build them outside the Reserve, but it would become more expensive. These obstacles the Reserve creates are clearly powering the conflict with this fish farmer (**value**).
G5 says that they have been battling for aquaculture (**interest**) at the Reserve, because they block most of the projects for the region (**fact**). The Reserve uses the most diverse arguments, ranging from the organic pollution derived from fish farms, to the proximity of rice fields, which drop pesticides and could affect the fish farms. There are some aquacultures in the Alcácer do Sal municipality, but due to these restrictions, all of them are operating illegally (**value**) *(13)*. She believes that this prohibition is in part due to a lack of means on the side of the Reserve *(28)*.
G8 argues that the Reserve constrains the activity by disallowing the building of the necessary infrastructures to fish farms (**fact**), creating a barrier to the development of aquaculture in the estuary (**interest**). One of the main obstacles, which he feels as being ridiculous is the limit on the productivity of 3 tons/ha. This discussion has been extremed (**value**) – the Reserve says that fish farmers pollute and change the landscape; fish farmers reply saying that salt ponds were already there and that they have such species. The discussion goes down and down and there is no realistic discussion.
C1 feel that many rules are imposed (**fact**) by the Reserve without first establishing a contact, a previous dialog with fish farmers. To aggravate the situation, they are unable to implement the rules. This attitude from the Reserve is powering the conflict (**value**) – if they want to put restrictions, they should discuss with people, or else they will become more against the otter. Fish farmers permanently see the Reserve as an obstacle to their activity.
P9, through his association, has been working with the Reserve to define the rules for the activity. He says that there are some obstacles to the development of aquaculture (**fact**), namely the licensing, but he doesn't seem to blame the Reserve for powering the conflict (**value**).
A3 agrees with the obstacles imposed by the Reserve to fish farming and actually sees them as insufficient as, for example, some fences are allowed (**fact**).
G9 point out that they have to punish the frequent disobediences to the law – unauthorized works, waste in the pond walls, etc. This discourse leads us to believe that G9 disagrees with the **value** that it is the Reserve powering the conflict – the opposite is true. Also, the obstacles come from the fish farmers' side (**fact**), who don't dialog with the Reserve, refuse to give information and constantly disobey the rules.

G12 says the licensing process is very bureaucratic and that the Nature Conservation Institute gives issues too many negative opinions, therefore reproving the licenses (**fact**).

6.1.4.4 Fish farming is compatible with nature conservation

Fish farming is compatible with nature conservation (V), because it preserves abandoned salines areas (F) and avoids the fish resources depletion (F), hence it should be supported (I).

G1 disagrees with this **fact** in the way that from the biological point of view, fish farming lacks the affectation of the ancient *salines* habitats. According to this same stakeholder, even though he is not sure about the compatibility in general terms of fish farming and nature conservation, he is sure that in terms of space, they are not compatible, such as no animal can live in a tank with one and a half meter depth. The ancient density produced by fish farmers, who were also salt makers, used to be compatible with nature conservation, as it was an extensive production, without the use of feed. Nowadays, the number of fish farms, and the semi-intensive density practiced affects everything, as the production maximization is the focus. The *salines* habitat dies, the water that comes out is polluted, and hence the quantity of species that shows up is limited. Predators also increase because there's more fish. Though, stakeholder G1 has the opposite **value** in terms of this question, as he believes that the actual fish farming in *Sado* Estuary is not compatible with nature conservation.

A1 believes that aquaculture is compatible with nature conservation, although he thinks that *salines* would be better. Therefore this environmentalist agrees on the theme's expressed **value**.

P1 believes that aquaculture may even be a better way to preserve nature than *salines*, because salt is a sterilizer, though not natural, while fish farms are natural, because they contain a natural element present in the estuary: fish. This stakeholder also defends the **fact** that abandoned *salines*, are not useful to birdlife, since they are not used by those, and that the conversion to aquaculture promotes the environmental revitalization of *salines*. P1 defends his **interest**, saying that if it was in his hands we would promote aquaculture 100%, educating fish farmers to the needs of nature conservation, enabling the real compatibility between fish farming and nature conservation, which he has as a **value**.

P2 believes that without the intervention that fish farmers do on *salines*, those habitats will die, because of the spread of "gramatas". Even if this stakeholder doesn't refer specifically to the compatibility between fish farming and nature conservation, he believes in the **fact** that fish farming is the only way to preserve abandoned *salines*.

A2 considers that the transformation of a saline into a fish farm causes great negative impacts on the Reserve's fauna, especially on birdlife, not agreeing therefore in the **fact** stated in the theme above. This stakeholder has a different **value** towards this question, as he believes fish farming has environmental costs that are not internalized, and that would turn the activity economically unsustainable. He also believes that even if aquaculture is positive for otters, as they get to eat lots of fish, those are only a small portion of the whole trophic chain that must be protected.

G7 is aware of a certain conflict between the land uses of the ancient salt ponds, because, as she states salt ponds are important for birdlife, however aquaculture is the only viable economic activity that can be shifted into ancient salt ponds (**value**). She assumes that the Municipality tries to approach this question in a very neutral way, since there is a recognized conflict between fish farmers and the Reserve.

E2 thinks that maybe for the birds, abandoned *salines* are better than fish farms, this way understanding the **fact** differently. He also believes that there might be fish farmers that steel fish from the estuary to put in their tanks.

P6 believes that there are more birds and otters since fish farmers started in the *Sado* estuary, encountering this way the **fact** that fish farms preserve abandoned *salines*, and giving a true meaning to the compatibility between fish farms and nature conservation (**value**).
P10 sticks to the **fact** that fish farming avoids the fish resources depletion to defend that it is harmless to the environment. He strongly believes in the **value** of the compatibility of aquaculture and nature conservation.
Claudio believes it is best to have a fish farm than mood and grass, which is the case of abandoned *salines*, hence agreeing with the first **fact**.
E3, thinks that if *salines* are abandoned, they will be fulfilled with grass (*gramata*), and that any bird can land there, therefore it is a **fact** to him, that even if fish farms aren't the best solution for birdlife because of the water depth, they are better than having abandoned *salines*.
G4, even if it is from an economical point of view, he believes it is a **fact** that fish farming can easily face the problem of the decreasing fish stocks in the ocean. He strongly believes in the **value** of the compatibility of aquaculture and nature conservation.
P8 also believes in the **fact** that aquaculture faces the problem of decreasing fish stocks in the sea. Besides, in aquaculture there is not the waste that exists in sea fishing, where a lot of fish with no commercial value is caught and thrown away. In what concerns, fish farms as the preservers of *salines* ecosystems, P8 is not worried with the veracity of this **fact**, as he believes that both activities are unnatural and that if birdlife some way adapted itself to *salines* years ago, the same will happen with fish farms. He also states that as there are always aquaculture tanks that are empty, semi-full or full, there is always space for the birds to be; therefore he believes there is full compatibility between nature conservation and aquaculture (**value**).
G5, believes that nature conservation and aquaculture are compatible, such that they are forcing near the Reserve, so that they allow the implementation of more fish farms in their municipality (**value**).
G8 believes that aquaculture is compatible with nature conservation (**value**), because fish farmers are the first to reclaim and to guarantee good quality water.
C1 considers that the existence of fish farms in *Sado* may be even positive for the conservation of the otter, such as they may provide a supplementary source of food (**value**). They even believe that *salines* had certain impacts that fish farms don't have, like the impact of high concentrations of salt in the estuary fish and the fact that the people that worked on salt extraction were a lot more that those that work on fish farms, causing more stress on the estuary wildlife.
P9 believes the only way to preserve the centenary ecosystems that are salt ponds, is to transform the abandoned ones into *salines* (**fact**), as in the salt tanks that are abandoned walls tend to break, though not retaining water needed at constant levels for the avifauna. Confronted with the fact that the water depth in fish farms is not suitable for avifauna, he agrees, however he states that even if it is not suitable for some birds, it increases another species like cormorants and grey herons. He concludes that there must be a mid-term with salt ponds and fish farms, remarking that in his fish farm project he as 30% of area only for avifauna.
A3 states that aquaculture damages the ecosystem in the way that it steals space to the ecosystem that can no longer be used by species. He believes that aquaculture can only be compatible with nature conservation in a much more extensive perspective than the one that is practiced, since the objective of the Reserve should be the maximum protection of habitats (**value**) (TU 50-52).
G9 have no doubts in stating that aquaculture is fully incompatible with nature conservation purposes that the Reserve defines, they defend this arguing that where there are fish farms, there are no birds and there are no otters, so the growing of the number of fish farms is

something that scares them (**value**). They don't agree with the **fact** that aquaculture preserves abandoned *salines*, as they defend that even an extensive aquaculture is worst than a saline because there are no birds in it, and even an abandoned saline is better because it will always have more birds than an aquaculture. Nevertheless, they admit that sometimes abandoned *salines* get fulfilled of plants, which is not positive for the nidification, although they can feed themselves anyway.
A4 believes that it is possible to solve the conflict between fish farmers and predators, because there are even studies that he refers as evidences that predation of aquaculture fish is not that big as fish farmers suppose. He also refers that an abandoned saline is of no use for birds, as it isn't an extensive aquaculture where birds are totally scared away, so he points that a solution must be found to make compatible the purpose of wildlife conservation and aquacultures (**value**). Nevertheless, when asked about who looses with the expansion of aquaculture, he answers that the main looser is the nature conservation, because if the expansion is done in an anarchical way, important areas for conservation will be lost. A4 also refers that if there was a better management of fish farms, in what concerns the water levels, those could be more suitable for birdlife.
C2 believes that it is perfectly normal that the Reserve looks exclusively on their side, as it is normal that the fish farmers do the same. Which is not normal is that there is not an effort from a third party to compatibilize the interests of both stakeholders. He believes that it is possible to compatibilize fish farms with nature conservation, with adequate conflict mediation (**value**), although he believes that an hundred percent compatibility is not possible, as they have opposite interests, but an equilibrium point can always be found.
G10 recognizes that since the area was classified as a reserve, birdlife has increased in quantity and in quality, not referring at any change caused by aquaculture. When confronted about how compatible is fish farming with aquaculture, he answers that although is not sure, he knows that there two points of view, the fish farmers' one, who say that they are the first to claim a good water quality, and the environmentalist side who claim that polluted water is thrown out the estuary from fish farms (**value**). He also claims that maybe in terms of water pollution, the real problem isn't fish farms but the surrounding industries.
G11 agrees with the **fact** that an aquaculture preserves an abandoned saline, in the way that it is better for birdlife than an abandoned saline, although she believes that only extensive fish farms can do this right replacement.
G12 states that with the proper rules, aquaculture is an activity which fits very well to nature conservation purposes (**value**). She also believes that converting salt ponds into fish farms, avoids those areas turning into dumps.
C3 informs that for another area, a carrying capacity assessment for aquacultures in the estuary has been made, in order to see what would be the maximum limit allowed of aquaculture's land use. However, he states that from a strict nature conservation point of view, an abandoned saline is always better than an aquaculture (**value**), because even if it dries, the re-naturalization happens in a short term, filling itself with water, giving avifauna more space to get fed and to stay during the high water tides. He believes that the only way to preserve nature conservation, and mainly avifauna, is to certificate alternative activities like salt production.

6.1.4.5 Fences should be allowed

The use of fences should be allowed (V) because it prevents predation (F) avoiding fish farmers to kill otters (I).
In this point G1 has a different **value**, in fact, they don't allow fish farmers to put fences, because, as they say, predators have the right to circulate in all the reserve's space, and should not be thrown away . When G1 explains to fish farmers that they cannot use fences, they

threat that perhaps they will do like some neighbours of them that have killed otters. G1 doesn't agree that the reason they put fences is to prevent otter to get inside the fish farm, they believe they use the otter argument, in order to be able to put fences to protect their property from thief's and other problems (**fact**). They also defend that an area inside the reserve could be defined for aquacultures - the problem in this solution, according to them, would be the difficulty to establish a ceiling.
P1 states that as otters eat fish from aquacultures, and fish farmers don't know how much prejudice they get from this predation besides not being allowed to put fences, they kill otters to avoid predation (**value**, **fact**, **interest**).
P2 believes that otters are not a threat, and that they are even helpful because they eat the fish with diseases and fish that are less strong. In that way, he thinks fences should be taken away where they exist (**value**).
P3 argues that are no measures that can be taken to avoid predators, because they get used to all of them (**fact**).
P4 believes that in the some way as he has a fiscal duty beyond the State, they should allow him to protect himself from predator's attacks (**value**), as he believes that in his fish farm, an electric fence with twenty centimetres high would easily solve the problem (**fact**). He also claims that conditions should be given in order to avoid otter killings because, although he says he has never done it, he claims that are known cases of otter killing (**interest**).
E2 believes that there is no reason at all for the Reserve to forbidden fences (**value**), because that way, fish farmers have to kill otters to defend themselves, hence is preferable the use of fences (**interest**) (TU 48).
P5 has already threatened the Reserve, when they made him take out fences, that he would kill the otters if they went predate to his fish farm (**value**). P5 defends himself saying that the fences only have one meter high e behind the bushes that already can't be seen; therefore they do not constitute a real impact on landscape.
P7 believes that as the properties belong to the fish farmers and not to the Reserve, fish farmers should be allowed to put fences to defend themselves from predation (**value**, **fact**).
E3 thinks that whatever is the measure to stop otters from getting in the fish farms, when they are hungry, they will get in anyway, even with electric wires (**fact**).
P8 believes that fences don't have any impact on the environment or in the landscape, and besides they are the way for a sustainable coexistence of otters and fish farms (**value**, **fact**).
G8 also sticks to the **fact** that there are no efficient measures to avoid predation from otters, not even electric wires that appears to be best available solution.
P9 states that the reserve must allow the use of fences (**value**), since it is the only viable way to fish farmers prevent themselves from otter predation (**fact**), and though it avoids otter killings from fish farmers (**interest**).
G11 states that there are fish farmers that have fences to avoid otter predation, and nevertheless the otter manages to get in, how, fish farmers don't have a clue (**fact**).
A3 agrees with the fact that fences shouldn't be allowed, besides other reasons that he does not explain, also because otters get stuck in them sometimes (**value**).
C2 believes that fences or other protection measures, are harmful to nature conservation, and that fiscalization should be higher in order to prevent them (**value**).
C3 believes that dissuasion techniques for predation, like physical obstacles, should be allowed in cases where it can be proved, that there is an effective damage on the activity which doesn't allow it do develop, in other cases, predation should be taken in account as a cost of the activity just like others costs, as fish farmers are profiting from the use of a common good, they should respect and preserve (**value**).

6.1.4.6 Otters are a threat to fish farms

Otters are a threat to fish farms (V) because they consume lots of fish (F), causing damage to the activity (I).

G1 recognizes that there is in fact predation of fish from otters, although they believe fish farmers tend to overemphasize the quantity of fish that is overtaken (**fact**). They state that when they get to a have a neutral talk with someone about it, they perceive that the situation is not serious as fish farmers describe it (**value**).

A1 believes that there is no conflict at all between fish farming and otters, in what regards predation, and that fish farmers who say that, say it by ignorance (**value**, **fact**).

P1 believes that otter, besides eating all kinds of fish, she eats about four kg a day, corresponding to twenty euros per day, which is a big damage (**fact**). Nevertheless, he mentions that in his area, due to the high population density, there are not many otters; hence he is not affected by them.

P2 states that the otter eats fish from aquacultures, but she is not a real big problem (**value**), as she eats a lot of dead or ill fish (**fact**).

P3 also believes that otter is not a big problem in his area (**value**), and that as they eat small fish, which is cheaper, otter's predation is not very serious (**fact**). He also states that he believes that the otter eats about four kg a day, and if she has the family around, she will bring them on to eat fish, but she attacks only by night, and about three or four a.m., P3 says that normally he is around the fish farm.

A2 finds that it is impossible what fish farmers say that otters eat about four kg a day, as an adult otter only weights about seven to eight kg (**fact**).

P4 believes that the otter plays a lot with fish causing a lot of waste, even when she is already full. He also states that he has a lot of otters around his fish farm, which causes a lot of damage (**fact**).

G7 although not discarding the hypothesis of the otter predation's existence, she claims to know nothing about it (**value**).

P6 believes otters don't go too much near her fish farm (**value**).

P5 says that in his fish farm in *Alcácer do Sal*, otters are a big threat as he believes that around his fish farm there are about dozens of otters (TU 10). He also estimates that a otter eats about four kg a day, and if they ate only sole fish, the damage would be around ten, fifteen thousand euros a year. He says that before he had a fence in *Álcácer do Sal* fish farm, they used to put eleven tones, and they would only get four tones of fish. (**value**, **fact**, **interest**)

P10 has no idea on how much does the otter predates in his fish farm, although he admits that other fish farmers complaint a lot about the otter (**fact**).

P8 believes the otter is one of the most significant predators, as when they enter a tank, they eat until they can't stand anymore (**fact**); nevertheless he does not mention any data.

G8 thought it was not very probable that otters would exist in zones that fish farmers point out in *Sado* estuary, but after getting some real evidences on the field, he started to perceive that there is in fact otters' predation. He considers that otter is in fact a problem for fish farming, but he does not quantify, nor he is able to, how significant is this problem (**fact**).

C1 are studying the effect of otters predation's on fish farms, and at the moment is early for them to state anything about the threat that otters represents to fish farms (**value**). They also state that is hard to gather information talking with locals, because fish farmers state that otters cause an enormous damage on predation, and people from the Reserve state that otter's predation is insignificant. Nevertheless, they think fish farmers overemphasize the quantity of fish they claim that otter eats. They talked to fish farmers that have pointed out that otter eats between four to eight kg a day, which is impossible in the C1 opinion, once otters weight a maximum of nine kg. The data these C1 have, points that when they are on bondage, one otter eats a maximum of one and a half kg per day, which is a greater value than the one which can

be found in nature, because usually animals tend to eat less in nature than in bondage (**fact**). They also find that it is difficult for a fish farm to have a annual depletion of three tons a year like some fish farmers complaint, because that would meant an enormous number of otters around a fish farmer, which is not compatible with other data.
P9 states that the otter's damage to the activity is easily measurable, as in one of his tanks before the presence of the otter (which he confirmed with the FRAP ecological team working on the field), he had about three to four hundred kg of fish, and now he claims he has no more than four kg (**fact**), which results in five thousand euro damage per year (**interest**).
A3 states that all he knows about otter predation is that there are complaints from fish farmers about otters eating fish from their aquacultures (**value**, **fact**).
G9, when asked about predation, they point out immediately the otter, as a big problem fish farmers are always complaining about. Later on the discourse they state that after all, complaints about the otter are not that frequent, because the big issue are the cormorants. The rangers don't state anything specific about how much represents the otters' predation on fish farms, constraining their discourse about otter predation, on fish farmers' opinions. (**value**, **fact**)
A4 refers otter as a possible predator, but he is not sure about it. (**value**, **fact**)
C2 believes that since the otter is a very furtive animal, they don't approach near fish farms with human presence or with dogs, and that although fish farmers complaint about it, the effective impact of otter predation on fish farms is nearly none (**value**).
G10 when asked if he ever sees otters around, he answers that it is very difficult to spot them, and that he ears fish farmers complaining a lot about otter damage mainly in eel's tanks (**value**).
G11 refers that is hard to quantify the conflict in terms of predation, because first of all, fish farmers don't know how much fish they put inside (**fact**). She also states that even if it's true that otter eats fish from aquaculture and causes stress in the tanks, it is not true that they eat twice their weight, as she refers that some fish farmers' complain (**value**).
G12 states that the DGPA has no knowledge on the conflict between vertebrates and aquaculture and that they have never been involved. However she claims to know that the otter eats about eight to nine, even ten kg of fish a day (**value**).
C3 has conducted an assessment of the impact of otters in fish farms in another area, where he has concluded that otter eats mainly non commercial relevant fish. He also believes that when fish farmers talk about predation, they expose their perception, more that the real impact himself, as they talk a lot about cormorants as they can see them during the day, and don't talk so much about otters because they cannot be seen so easily. He also states that sometimes when fish farms are not very well managed, owners tend to blame or to give more importance on external factors as predation as a scapegoat (**value**).

6.1.4.7 Pollution from industries is a major problem

The real problem of water pollution in the estuary (V), lies in the emissions from industries and other economic agents close or within the Reserve and not in fish farms (F), which are defenders of the water quality (I).
G1 does not specifically refer pollution from industries, but does mention that the water that goes off aquacultures is polluted water (**fact**).
A1 sees a lot of problems arising from the industries around Sado, like overheating water, filters that kill eggs and water pollution (**value**).
P1 claims to have scientific evidence produced by one university, which proves that the water that goes out from fish farms tanks has better quality than the one that gets in (**value**, **fact**). He also refers that before the settlement of some industries, it was possible to produce oyster in the *Sado* estuary, which is not possible anymore. He refers that at the time there were about

four thousand jobs during winter in *Sado* estuary fishing activities. He states that they defend nature more than environmentalists, referring specifically to the fact that they are severely affected by a bad water quality (**interest**).
P3 reclaims that the water quality should be monitored by the reserve, as rice crops and one of the factories in the surroundings, drops dangerous effluents that seriously threaten their fish production (**value**).
P4 slightly talks about industries pollution, as the real problem for him is the rice crops' pollution (**value**).
E2 complaints about the fact that even if industries are out of the Reserve borders, such borders don't make any sense, since during the high tide the water takes the pollution from these industries up the Reserve area. He even accuses that when a new factory needs to be built, the Reserve limits are changed in order to include it. He also blames the rice crops producers of making pesticide discharges every year (**value**).
P6 complaints about the lack of an entity that controls the water quality and that also would receive complaints about the water pollution. She refers for instance, that several fish farmers are severely affected by the sewage water which is not submitted to treatment, and that there is not any entity responsible for collecting that kind of complaints (**value**).
P5 refers that they are the first persons ready to be cooperative with the Reserve, as they need a good water quality to work and when there are water quality problems, they are the first harmed (**value, interest**). He also complains about the discharges from rice crops. Finally he says that if oysters get along well inside fish farmers which they don't out in the estuary, such fact reveals that water has greater quality inside fish farms (**fact**).
P10 states that his great rage towards environmentalists is the fact that they (fish farmers) have to be a lot more careful with the water they put in than with the water they throw out. In fact, according to him, they are a lesser problem, as they are the first to suffer with the water pollution.(**interest**). He adds that whenever there is a chemical discharge from rice crops, they are the first to warn everybody, as they have to work nights and weekends, which people from the reserve don't as they are public workers, in order to prevent this situations and other similar. After complaining also about the industrial and the municipal sewer which is thrown to the river bypassing the treatment station, he reclaims that is it unacceptable that anyone accuses them of polluting the water, which happens frequently, as they are, as he states, the scapegoats (**value**, **fact**).
E3 states that there aren't any clean rivers any more, and that the *Sado* is not an exception. He says that for instance, when the Renault factory used to discharge, all the *gramata* used to die (**value**).
G4 believes that even that are discharges, they are authorized, legal and controlled, and hence he doesn't believe they can be harmful to fish farming or even to nature conservation in the estuary (**value**, **fact**).
P8 states that fish farming tanks works like water treatment facilities as they clean the water through oxygenation and through organic matter decomposition. He refers that big industries don't have any excuse for polluting as they do, and that since there is fish farming in the estuary, some areas are cleaner and with more biodiversity (**value**, **fact**). He says that since fish farming has installed herself into the *Sado* Estuary, environment problems are being thrown at day light more often, as fish farmers are the first to suffer with water pollution (**interest**). He also states that the Portucel argues that they were there first than the fish farmers, as they are disturbed by the complaints and law processes that fish farmers turn against them. Therefore, he adds, fish farming is the first effective way of preventing the water pollution. At last, he recognizes that industries are getting better in terms of water pollution, and the problem now, are more the rice crop discharges and the non treatment of sewers from municipalities.

G5 tells that the Reserve forbids fish farming in some areas because of the damage on water quality, which in her opinion is not a valid statement, as that can be technically solved (**fact**). She also tells that some are forbidden because they are to close to rice crops, where pesticides are dropped by plane, which according to her doesn't make any sense, as what should be forbidden are the pesticides discharges by plane and not fish farming.
G8 believes that fish farmers have the right to demand a good water quality, as they legally settled in that area with that assumption (**interest**). As he states, even if that demanding goes towards him, as he is part of the administration, he claims that he will for sure redirect that demand towards all the industries in the surroundings of the Estuary. As he says, it concerns him, to see the technicians from the Reserve not allowing a density increase on fish farms of three tones, while all the surrounding industries are making many harmful discharges on the estuary (**value**, **fact**). He exalts the idea of the need of a good water quality for fish farming, stating that even before the species in the estuary are in danger, fish farming will no longer be viable, as first there will be the economic problem, followed by the ecological problem. He is also a defender of the fact that if there weren't for fish farmers, no one would warn the authorities about illegal industrial discharges in the estuary.
P9 claims to be happy that there is someone else (the Reserve), who attends to the estuary water quality besides fish farmers (**fact**). He claims that even if the surrounding industries and the municipalities are getting better every time, in terms of treating their effluents, they cause water quality problems almost every year (**value**).
G9 state that the water pollution is not their responsibility as the polluters are outside RNES, even if he recognizes that fish farmers complaint a lot about the water quality (**value**).
C2 is also a defender of the fact that fish farmers have legitimacy to demand a good water quality to the administration, since they pay taxes, they follow the rules and they are legalized. And according to him, the administration should be diligent to industries and other economic agents and help fish farmers in this point, as their activity besides being legal, it provides jobs, it provides added value and provides income taxes (**value**, **interest**).
G10 states that the pollution in the estuary in the early eighties has ruined the oyster production that used to give support to many families around the area. Now, that there is a Reserve, people don't see any change in that situation, which turns people against the Reserve's management, as there is no benefit in her presence (**value**).

6.1.4.8 There's a lack of well defined rules for aquaculture

There's a lack of well defined rules concerning fish farms (V) which results in disobedience (F) to allow the expansion of the activity (V).
G1 says there is no land use plan up to date. This plan should establish areas with different vocations and safeguard the most important areas. Also, regarding aquacultures, there are no defined rules (**value**) that could take into account things like the carrying capacity of the ecosystems. However, despite there is no written legislation, they say that there are rules – for example regarding the fences that can be installed. In 1995 there was an attempt to implement this regulation, but it never managed to get into law. National legislation towards aquaculture has no references to environment. G1 does not directly correlate the **fact** that there is disobedience to the law by fish farmers with the absence of rules, since they don't fully agree on the value. However, they admit that there is a gap concerning the regulation of mitigation measures for predators, which is resulting in fish farmers implementing illegal measures.
P2 complains about a work that the Reserve made him stop under some legislation he didn't seem to know about. Despite not making direct commentaries on the topic, this stakeholder seems to be more worried with the already existing rules (**value**).
The same goes for P3, who is complaining about the regulations concerning fish densities (**value**). He is disobeying the law, by producing more than what he is allowed to do (**fact**).

P4 says that a building he wanted to raise was blocked by the Reserve. According to him, this was inside the limits. No mention was made about the defined rules, but his speech leads us to consider that he agrees with the **value** that there are no well defined rules for fish farms. This is further intensified when he says that there is a difference in the treatment given to extensive and intensive fish farms *(14)*.
E2 complains about the lack of regulation for their specific activity of ecotourism. At the same time, they point out that the Reserve is too prohibitionist concerning the use of mitigation measures by fish farmers. It's clear that they consider that rules for aquaculture are badly defined (**value**) and that this is leading to disobedience and to killing of vertebrates by the fish farmers (**fact**).
P6 only makes a short statement on the rules concerning fish farms. They feel restrained by the rules (**value**) and say that there should be a dialog between the Reserve and the fish farmers.
P5 points out to two problems he suffered concerning regulation of aquaculture in the estuary: the use of fences as a mitigation measure and the licensing scheme. Someone from RNES once told him that when he has doubts concerning something, he prefers to say no. This is clear evidence that there are no well defined rules for fish farms (**value**).
P10 complains about fish farmers, with such a small impact, having the same treatment as, e.g. seine fishing. "Two weights, two measures", he considers. This denotes a concern with the existing rules, equal to everyone, despite the difference between the activities (**value**).
E3 feels that the rules are there and they should be obeyed; if there weren't rules, there would be no nature left (**value**). Some people don't go well with these rules, but feels that people should comply with them (**fact**).
P8 relates a case where he didn't know about the need to ask permit to install of gas cannons. He had to take them off and feels this is inadequate (**value**) and that fish farmers rest only with the alternative of shooting cormorants (**fact**).
G5 comments that the problem is that there is too much legislation for fish farmers (**value**) in the municipality of *Alcácer do Sal*, due to the existence of several land use instruments – the regional land use plan, Natura network and the protected area.
G8 says that there is a lack of plans concerning land use (**value**), which leads to the aquaculture being punished all the time (**interest**), everywhere.
C1 say that fish farmers complain that there are different policies in different protected areas (**value**), leading to a feeling of unfairness and to the illegal chase of otters and the application of illegal mitigation measures (**fact**) *(15)*. This unfairness issue if further promoted by the feeling that there are "friends" of the Reserve, to whom everything is allowed.
P9 says that a land use plan would formalize things and put everything more clear, solving situations where things are rejected on a mood basis (**value**).
A3 says that a land use plan is crucial for the protection of nature in the Reserve (**value**). Also, the existing regulation concerning, e.g. the use of fences is too permissive, as it allows some fences to be installed and that are harmful for otters.
G9 say that despite punishing the illegalities, people keep disobeying (**fact**). This is due to problems in the system, ranging from jurisprudence to legislation issues (**value**).
A4 thinks that everyone loses (but especially nature conservation) with the lack of rules (**value**) that allow the anarchic expansion of aquaculture. There should be a management and land use regulation that would limit zones and define those that should be protected.
C2 claims to be a "defender of an aquaculture made with rules of respect towards nature conservation and biodiversity". This is something that doesn't happen, neither from the side of fish farmers, neither from those who regulate the activity (**value**). Contrarily to the opinion of most stakeholders, he thinks that the land use plan is the last thing that should come out – first there is a need to create regulations for the activities, through discussions and consensus with

each economic activity. This rules should be "generated not imposed", else people will not respect them (**fact**). Starting with a land use plan would render consensus impossible, due to the vast array of interests involved.
G12 says there are some illegal fish farms (**fact**) because they keep reproving licenses, due to very strict regulations (**value**).
C3 says that before the creation of a land use plan in the Natural Park of *Costa Vicentina* things were decided on a very casuistic basis (**value**), because it went through different technicians – with different technical backgrounds – in the Reserve. After the plan came out, decisions became better and conflicts were reduced.

6.1.4.9 The Reserve lacks means to enforce the law

The Reserve has no means (F) to enforce the law (V), resulting in its disobedience (I).
G1 does not speak about a lack of means in the territory. The law enforcement is made through the Rangers (**fact**).
A1 points out that the Rangers work too much and that the Reserve areas are too big to be managed. There is a lack of means (**fact**). On the other hand, the Nature Protection Service of the National Republican Guard (SEPNA) has been doing a great job. There should be teams visiting aquacultures regularly, not simply licensing them and entering in conflict (**interest**).
G6 speaks about his newly formed service (SEPNA) and the means that it has been receiving. At this point they are still at 20/30% of their force, since more money, materials and personnel are needed (**fact**).
A2 points out to bribery problems with the Rangers, since they earn only one-third of wage of the Maritime Police (**fact**, **value**).
G7 makes a short note saying that the only control there is in the Environmental Impact Assessments is that from the people, since there are no means (**fact**, **value**).
G2 says that the 3 people available in is SEPNA team basically have only time to give answer to complaints in the area (**fact**, **value**). Besides this, there is a very big lack of means, like cameras, and they frequently have to use their personal equipment. Their intervention particularly in the Reserve is very limited, until the promised and still not available means arrive – after this it will be possible to have an effective action.
E2 says that there is only some control in the Reserve when a report comes out in the TV (**value**). The Reserve creates some good regulations but after does not make any control of it. On the other hand they complain that some regulations don't come into force (**interest**) because there is a lack of means (**fact**) and a lack of control.
C1 claim that the Reserve puts restrictions, but makes no control of them (**value**). This is a very important issue, since if people see others disobeying and not being punished for it, there starts to be a complete discredit for the conservation. They give the example of the otters, where people know that it is illegal to capture them, but then there is no control at all (**interest**).
P9, while speaking about the creation of a regulation and the slowness of the process, points out that this is due to the relocation of all the available technicians to the Natural Park of *Arrábida (70)*. The processes go on slowly because there is a lack of technicians in the Reserve (**fact**) *(75)*.
A3 says that the Reserve has been doing the management with the "means they don't have" (**fact**) and that is a major problem. He believes that the Reserve has lost with the fusion with the Natural Park of *Arrábida*.
G9 say that the major problem is not the lack of control or of means, even though it would be better if there were more rangers (**fact**). What happens is that people know when the rangers are coming – there are informers that know the rangers' car plates and can check when they are in service or not (**value**). They say that due to the common management of the two

protected areas, the surveillance in the summer is completely relocated to the Natural Park of *Arrábida*, leaving RNES almost without any control. A fusion would, however, be very complicated at this point, since that would involve huge investments in infrastructure, cars, etc..
C2 speaks more about the way rules are implemented than the lack of means to enforce them. He believes that a preventive and pedagogic path has to be followed, because it is impossible to have "a policeman for each citizen" (**fact**, **value**). He also criticizes the bureaucracy of the control process – to enter in a property for control they almost need a judicial order.
C3 says that the control means in the *Costa Vicentina* are bad and getting worse. When asked about the creation of rules and lack of control to enforce them, he speaks about a general structural problem in the Nature Conservation Institute. They don't know what policies to follow, they have no money and there is influences traffic. Guards often doing something and the director of the Reserve block the action (**value**) – this leads to the demotivation of the guards. Communication and dialog is also affected because there are few people in the protected areas (**fact**), which are already full of work.

6.1.4.10 Cormorants are the real threat to fish farming

The real threat to fish farming are cormorants (V) as they destroy a whole production in a few minutes (F) resulting in economic disasters to the fish farmers affected (I).
G1 ascertains that besides the existence of scientific evidence on cormorants' predation, there are complaints from fish farmers and an ascertainment from the Reserve and third parties that confirm the veracity of those complaints (**value**). However they state that whenever a fish farmer complaints, the others tend to complaint by influence. Nevertheless they also remark that the scientific evidences of the cormorants predation does not give any data on how damaging is this predation to the activity (**fact**). In terms of the threat that cormorants represent compared with otters, the main difference they state is that the cormorants occur more often in populated areas, while otters like better unpopulated areas.
P1 states that cormorants sometimes get together in bands of one thousand and attack at once a fish farm tank eating almost all the fish inside (**fact**). However, as states, they don't do the massive attacks often, and other punctual attacks are easily prevented with nets above the tanks (**value**).
P2 states that cormorants are in fact the only serious threat to aquaculture activity, as he even says that those ought to be murdered. He says that he defends himself by putting a net over the tanks that makes them think they are above a fishing net like the ones they find in the ocean and where they get caught. When questioned if the only vertebrate that represents a threat to his activity is indeed cormorant, he answers that it is true for him as for everybody in the activity. (**value**)
P3 states that the worst predators for him are cormorants, and not so much the otter. He claims that for instance, one day two cormorants drop by, eat some fish, and on the next day, two thousand of them drop by (**fact**). He also recognizes that even if otter is a damaging predator, the cormorant is of bigger concern as he drops by on groups of thousands. (**value**)
P4, even he refers a lot about the damage caused by otters he states that cormorants are the worst predators (**value**). He also states that he has fifteen percent losses due to predation, although he does not specify how much from each predator.
P6 states that in the present year cormorants haven't visited yet their fish farm, nevertheless, usually in the winter they cause an enormous damage, as she states, three to four cormorants can destroy a tank with twenty thousand fishes (**fact**). She also states that cormorants eat half of every flour bag they have to feed the fish in the tanks.
P5 refers cormorants as a predator, but he seems to give more importance to otters, as when asked about which are the worst predators, he refers that otters can give an annual damage of

ten thousand or fifteen thousand euros. (**value**) It is important to refer that P5 has also a fish farm in *Alcácer do Sal*, where the otter frequency seems to be much bigger.
P10 starts to refer to cormorants emphasizing the frightening way in which they proceed their attacks (**value**). When asked about data on the damage caused by predation, he answers that it is a question that bothers him, but he is not sure, referring nevertheless, that a band of cormorants can take down a whole production in fifteen minutes, as he already has seen it (**fact**).
E3 directs his complaints on fish farming predation towards cormorants, as he says they are a destroying animal which kills or destroys everything. He also complaints of the fact that they have been growing a lot during the last years, although he states that he has not seen them lately, as he believes they have moved towards dams (**value**).
P8, not extending too much on the subject, he believes that otter and cormorants, are the greatest threat as predators to fish farming. (**value**)
G8 starts talking about bird's predation, saying that it is bad for fish farmers, but it might be good for birdlife (**value**). He also states that comparing with other places, like the Mira river, where there is only one big fish farm, the situation is not that serious, as this predation is spread all over the fish farms in the *Sado* estuary (**fact**).
P9 talks a lot about mitigation measures on cormorants predation, as he seems to have several disposals in his tanks to avoid predation, hence he does not talk about how threatening is this predation or how much does it costs (**value**).
A3, when asked about who could be the predators of fish farms, answers that he is only aware of cormorants, as he knows fish farmers complaints a lot about them, adding later that the otter might also be a predator (**value**).
G9 state that cormorants are a real threat to fish farming, as fish farmers complaint a lot about them, and they have already seen a cormorants attack, where a band of about five hundred has caused a lot of damage to a fish farm (**value**, **fact**).
A4 knows fish farmers complaint a lot about cormorants predation, but he believes that cormorant's predation is not as serious as fish farmers state, and there is even scientific evidence that proves it, and that maybe that problem could be solved with environmental education (**value**).
C2 recognizes that cormorant's predation exists, and it is more significant than otter predation (**value**).
C3 believes that usually, when an activity is not being well managed, people tend to complaint towards external factors, in this case, towards predation. However, he believes that cormorant's predation might be significant, although he is not aware of its amplitude in the *Sado* estuary (**value**).

6.1.4.11 Aquaculture is an activity with potential

Aquaculture is an activity with potential (V), because it generates employment and richness (F), therefore promoting local development (I).
G1 thinks that fish farming has a fake potential, since the market is already overcrowded with fish (**value**). The development of the activity has been promoted by community funds, but after they go bankrupt.
A1 thinks that economic growth of the region is derived from big industries (**fact**). He knows of cases where investment in aquaculture has been a frustration (**value**).
P1 says that a positive evolution, both in quality and quantity, is taking place in fish farming (**value**), despite all the efforts from the Nature Conservation Institute to halt the development of the activity. *Salines* can no longer have economic profit and the alternative is aquaculture. The Reserve should therefore allow 1000 ha (out of 15000 ha of wetlands in the Reserve) to

fish farms. This would lead to an increase of environmental quality and richness and generate employment (**fact**).
P2 says that aquaculture in the *Sado* estuary has a great potential (**value**) – even without feeding, it is possible to do as many fish as we want and with good quality. He states that "two ponds would be enough not to starve" in the *Setúbal* region (**fact**).
P3 for one side thinks that fish farming in Portugal faces a strong problem with international competition, which puts a cheaper product in our market. However, he also says that the sector has already some development and that more will come when the government starts believing in aquaculture as an economic source (**value**, **fact**).
A2 says that people only speak about the benefits of the activity without taking into account the ecological costs. He also criticizes subsidies given to processed feed. His speech clearly dismisses the potential of aquaculture (**value**).
P4 believes fish farming is an important activity for the region in terms of employment (**fact**) and that it will be the future in terms of supplying the country with fish (**value**).
G7 says that the municipality sees fish farming as important but tries to keep a neutral position, because it conflicts with other activities (salt) and issues (bird conservation) which are also important (**interest**). She believes it's an activity in expansion (**value**) and with some importance, but the big potential of the area is in tourism (**fact**).
The importance of aquaculture in the *Palmela* municipality is very low according to G3 (**interest**), since they have a small amount of area in the estuary and all belongs to a single owner. He has no idea of the amount of employment that is generated by fish farming, but he thinks that aquaculture will not expand too much because there are, for example, restrictions in the intensity it can have (**value**).
P6 believes aquaculture is a business with future (**value**), especially because new types of fish will be produced. They give employment to 5 people and with another area of the same size it could go to 10-15 people (**fact**).
P5 says that fish farming has been increasing in the last years, but that it isn't enough to have employees – those who have people employed are going bankrupt (**fact**). In fact, the price of fish has been decreasing, while the feed increases (**value**). He doesn't know if there is something that could be done to improve the situation, since there is too much external competition.
P10 believes aquaculture is an area with future (**value**) and he and his partners have put their dedication into it. Many people came to aquaculture attracted by community funds some years ago and were only a prejudice to it, but now only those who really care about it have stayed. He argues that fish farming is very important for local development since it's an activity that can only be done there, contrarily to most of the existing industrial activity of the *Setúbal* peninsula (**interest**). This activity can generate employment for the area and give economic benefits to the area and the producers (**fact**). He points out that the Fisheries State Secretary says aquaculture is an activity without importance because most of the sales are done illegally.
P7 says that aquaculture has been working as a complement to fisheries in terms of fish stocks, especially the seabream. There has been an increase in aquaculture production and he believes it's going to be the future, since fish banks are getting exhausted (**value**). He also thinks that aquaculture is an important source of employment in the area (**fact**).
E3 thinks that there's an overall tendency to go from *salines* to aquacultures, since the fish is always sold. He sees a big development in fish farms and believes they will increase, but then he also says that production costs have been increasing and the price of fish has been decreasing, making the activity less attractive (**value**).
G4 sees aquaculture as an alternative to the depletion of fish stocks. He believes the *Sado* estuary has excellent conditions for the development of this activity (**value**). In a region with

high unemployment rates, he believes aquaculture can have an important role in creating jobs (**fact**).
P8 looks at the consumption of fish in Portugal to say that we have, and have always had, a deficit in fish production. He uses international data to say that aquaculture is the food activity with the biggest increase in the world and that there is no alternative to it (**value**). Portugal has all the natural conditions to produce fish with high quality, contrarily to some of its biggest competitors like Greece. Concerning employment in the region, he says aquaculture has currently some importance, but could give more (**fact**) if there were less obstacles to its development. With an increase of the production to 20 thousand hectares, there could be 4 to 5 thousand jobs on aquaculture – as many or even more than AutoEuropa, the main industry of the Peninsula – and a very high added value. This point could be reached within 10 years.
G5 believes that aquaculture could promote local development in its municipality (**interest**), if it wasn't for the permanent obstacle put up by the Reserve. The evolution of fish farming is mainly dependent on the choices of the local decision makers. She thinks the natural conditions in the Estuary work as a **value** to the potential of the activity. There is also the idea that fish farming could bring an added value to the nature tourism the municipality wants to promote. She thinks that aquaculture could bring employment to several unemployed people that have low education levels (**fact**).
G8 thinks that aquaculture has been growing at a national level, but slower that he would like to. This growth is sustained and is followed by a growth in other services and activities associated to the production of fish. The Portuguese product has so much quality that nothing is lost and it is largely sold in external markets, like Spain and Italy, for high prices (**value**). If productivity was increased to 10 ton/ha, there would be big advantages in terms of profit for fish farmers – he believes that this is perfectly feasible and will happen in the short term (**fact**).
C1 feel that the transformation of *salines* into aquacultures has brought major benefits to people (**fact**) *(80)*. Each fish farms employs several people. Fish farms have a tendency to growth (**value**), since the Portuguese are major fish consumers and fish from the sea has been having price increases *(81)*. Aquaculture production in Portugal is still very far from what it should be – in a supermarket we can only find seabream from Spain or Greece.
P9 sees aquaculture as the only viable economic activity that will fit in the abandoned *salines* (**value**). However, he thinks that the growth of new aquacultures will be lower in the next years, since profit margins have become too low.
A3 feels that aquaculture as an irrelevant importance to the local economy, involving not more than some tenths of people in the *Sado* estuary (**fact**). He has no perception of the weight of aquaculture in terms of production, but generally doesn't see any potential coming out of fish farming in the Sado estuary (**value**).
G9 say that aquaculture might have some relevance in the local community, since it employs several people, with permanent jobs (**fact**).
A4 does not have a clear idea about the importance of aquaculture for the community, but he believes it is not very significant in terms of job creation. He does not see more than two or three people working on each fish farm (**fact**).
C2 says there is no clear development of aquaculture, both in the Reserve and all over Portugal. It is impossible for Portuguese fish farmers to compete with Greece, Spain or North Africa producers, but there is the possibility to explore the advantage of being in a protected area and benefiting from a better ecosystem quality. Right now, fish farmers are clearly missing the target (**value**). Fish farming has a very small weight in economic terms, especially because there are many illegal situations. There is some people employed, but the situation could improve if there was an effort to make the activity comply with fiscal laws (**fact**).

G10 says that there was a big expansion of fish farms in the last years that gave the idea that this would be a very profitable industry. However, the last year has been critical and some fish farmers have even closed (**value**). On what concerns employment, it is not an activity that creates many work places, but it still could allow for around 300 direct and indirect jobs – it is far away from what the salt industry had (**fact**). He feels it would still be positive to have a development in aquaculture in the area – even if it were a few workplaces, it would be good for the local development (**interest**).
C3 states the importance for local development of an aquaculture like the one in the Mira river (**interest**). However, he feels that most fish farms only have impacts and have absolutely no benefits. Aquacultures like the one in Mira, which have innovation capacity, are well managed and well controlled, are capable of generating richness and employment (**fact**).

6.1.4.12 Fish Farmers should get monetary compensations for otter predation

Fish farmers should get monetary compensations (V), as it is a good mitigation measure (F)to the conflict (I).
P4 feels that if the state wants to protect nature, they have to give him means to apply mitigation means for predators, since he suffers economic losses with them (**value**, **interest**). The state himself could be responsible to give out the materials needed, without giving money to anyone. Alternatively, he could present the losses to the state and the state would pay him the extra fish he would have to put to compensate the losses, but later in the discourse he says that this would not be viable because they would not know how many otters were there or how much fish has been killed (**fact**).
P10 thinks that he should not be the one paying to leave areas of his property to nature conservation, like he was forced to. If the state wants this areas and accesses to them, he should get money for it (**value**).
P9 has the opinion that fish farmers should either be allowed to apply mitigation measures that block the entrance of predators in fish farms or get compensations for it (**value**). However, he feels that it is difficult to quantify the losses and establish this monetary compensation scheme (**fact**).
G9 say that a compensation scheme, similar to that of the wolf, could be a way to reduce the conflict between aquacultures and species conservation (**value**, **interest**). However, it would be necessary for fish farmers to prove how much was lost with predation and right now they don't even share with the Reserve the exact numbers of fish they put in their tanks. On the other hand, they say that this scheme could eventually lead to this share of information and cooperation between the two parts (**fact**). The "authentication" of the predation could be done by hired specialists. They do not have a clear idea about the effectiveness of the wolf compensation scheme.
C2 says that to make activities compatible, it might be necessary to pay compensations to some fish farmers (**value**, **fact**, **interest**). He defends this kind of compensations as a way to relocate the activity from more sensitive areas and not to pay for predation costs. Part of the money for these compensations could come from community funds.
G11 says that the wolf compensation scheme – where complaints became higher than what could be caused by the current wolves' population – is causing major debts and argues against economic compensation measures (**fact**). It is very unlikely that the Nature Conservation Institute will implement this kind of scheme for other species. She also points out to a case in Austria, where a compensation scheme was put for the conflict between otters and fish farms and the number of requests ended up increasing exponentially. She believes preventive measures are the only way to work out the conflict (**value**). Even though she has the feeling that compensation measures are not cost-effective, there are no economic studies that could

estimate the cost-effective between the different measures – and also no economists in the Nature Conservation Institute to work on that.

6.1.4.13 Only extensive fish farming is compatible with nature conservation

Only extensive fish farming is compatible with nature conservation (V) because it has a lower charge in the ecosystem (F), hence it should be the only one allowed (I).

G1 believes that since the regime has turned into semi-intensive, the tanks are fulfilled with water all the time, the saline's habitats disappear and the water thrown out is polluted (**value, fact**).

P1 states that it is possible to give food supply to fishes, without changing the ecosystem, give though more profit to the activity (**value**).

P10 disagrees with extensive-intensive nomenclature, as he believes that there are better options in environmental terms used in an intensive fish farming, such as the flour with an high digestibility coefficient, than the ones that are allowed in the extensive regime, such as crushed fish (**value**). He also believes that the limits imposed on the density of production, besides not being justified by the reserve, are also senseless. Finally, he gives an example of how the flour they can use, is not pollutant at all, as with one kg of flour, they make one kg of fish, though all the organic matter is eaten (**fact**).

P8 claims that their fish farms are extensive, but even if they were intensive, that wouldn't make any harm to the ecosystem, as there are effluent treatment tanks where all the water can be cleaned before being thrown to the estuary (**fact**). He also states that they have been fighting a war to raise the density limit to more than three ton/ha, as that is the maximum allowed by the Reserve, and the semi-intensive regimes practice densities of about forty to fifty ton/ha without prejudice to the ecosystem (**value**). He also says that they have gathered with a group of experts from several universities to demonstrate to Reserve technicians that the density production could be raised; nonetheless the limit has not changed.

G8 believes that even standing to the fact that the *Sado* estuary is a protected area, a density limit of ten ton/ha is perfectly acceptable (**value**). According to him, the water retention time in the tanks and after in the decanting tanks, forces the organic matter to sediment, therefore, density cannot be raised too higher, or the fish farming tanks will be the first to suffer; in this line of argument is senseless to restrict density production, as the fish farmers will do it by themselves, in order to avoid the damaging of tanks (**fact**).

C1 believes that the ten ton/ha limit does not make any sense, as with that limit, production is not even profitable. She states that she has seen some studies from IPIMAR that demonstrate the lower or non existent impact on the ecosystem of a semi-intensive regime (**value, fact**).

P9 states that it is possible to make intensive productions without damaging the ecosystem, since they are made in closed systems. In what regards the other regimes, he believes that the criteria should be the quality of the water that gets out of the tanks to the estuary, and not the density of the regime produced. He says that the quality of the water that is thrown to the estuary depends primarily on how the all system is built and not on the density practiced. He gives the example of the paper factory installed on the estuary (Portucel), saying that he does not care on how much paper they produce, since they respect the law in terms of liquid or gaseous discharges (**value**, **fact**). However, later on the interview, when asked on what should be the path to increase aquaculture production in the estuary, he states that increasing the density is not ecologically correct, and that as there are no new licenses lately to produce fish in the estuary, fish farmers are following the path of raising production, which he claims causes more serious problems than increasing the fish farming area. We believe perhaps is due to the quality of the fish that gets affected, and also to the inability of fish farmers in general to raise density without any impacts.

A3, when asked if fish farming is compatible with nature conservation, he answers that only in a much more extensive perspective, because of the impacts on the habitats and because of the landscape changing. As he states, semi-intensive or intensive exploitations have a big impact on landscape. He adds that maintaining the original characteristics of the area, even maybe in a semi-intensive system, for him fish farming is feasible in the area (**value**).
G9 state that if fish farms are extensive is rather better that being from any other system, nevertheless they state that what birds like are *salines*, and that there are no birds in a fish farm, compared to a saline (**value**).
A4 believes that the compatibility with birdlife, depends a lot on the management of the fish farms, and on if the fish farm has scarecrows or other type of measures. He adds that if a fish farm is very intensive it is hard to have a certain level of compatibility, and if a saline is abandoned, it will be of no use to birdlife, then, he believes that a middle term must be found (**value**).
G10 believes that maybe reducing the density of production on fish farms, could help reducing or eliminating some pollutant discharges that might occur. He adds that he could never be heard from fish farmers making that kind of statement (**value**).
G11 states that fish farms are better than abandoned *salines*, but only the extensive ones (**value**).
G12 states that it does not matter if a fish farm is extensive or intensive, since the water thrown out has good quality (**value**).
C3 when asked about what is more appropriate for nature conservation purposes, an abandoned saline or a fish farm, he answers that in strict conservation purposes an abandoned saline is always better, as it regenerates after a few time with the coming up of the tides. He defends that fish farms cannot provide the tide refuge that *salines* provide to birds during the high tides. He explains that those birds must always be feeding themselves, in order to store the lipidic reserves they will need for migration. He adds that the conversion of *salines* into aquacultures is never good to conservation, as or birds don't use fish farms, or if they use they cause conflicts (**value**).

6.2 Variation of opinions among stakeholder

In order to assess the variability of opinions among stakeholders in general, we must first attend on the way base groups positioned themselves towards different themes. Afterwards it will be important to compare the variability amongst these groups with the variability of other groups where stakeholders from different base groups cluster. This remark makes sense as the following figures aggregate averagely stakeholders' opinions toward one theme, not knowing though if there are substantial differences amongst them.
In this chapter, the colour of the themes in the graphics shall have the following key:
Red - Disagreement towards the theme

Gray - Not clear agreement or disagreement

Blue - Agreement towards the theme

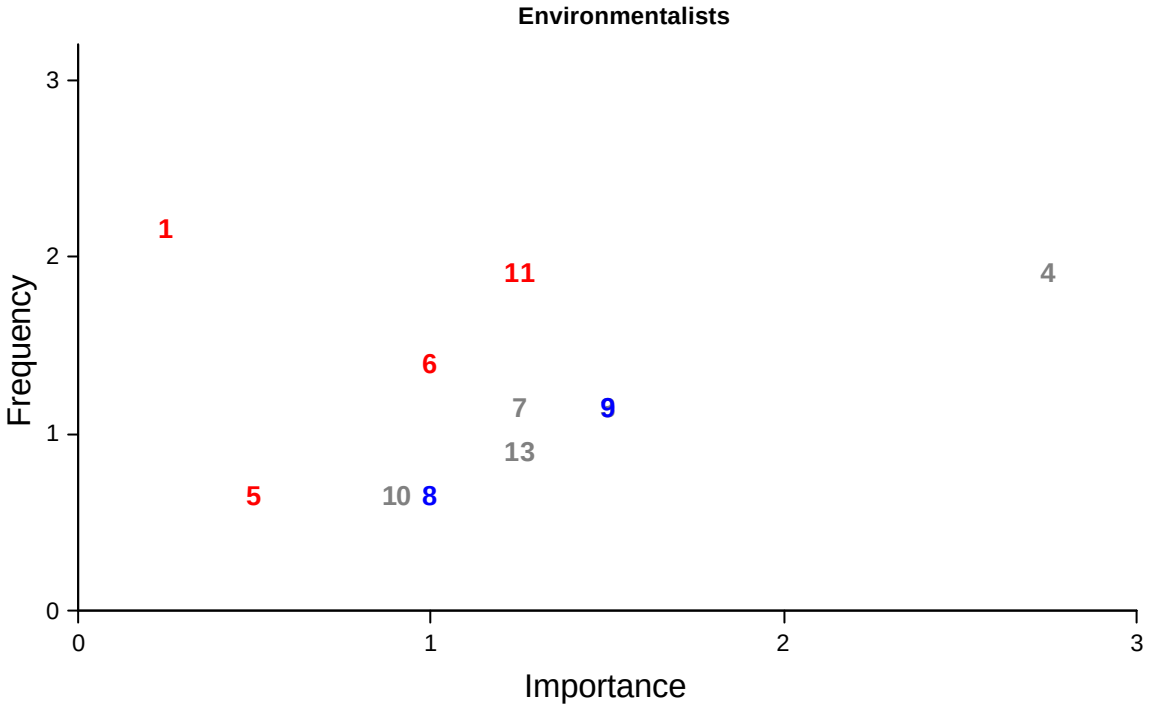


Figure 6.5: Opinions among environmentalists

1. Quality of fish in Sado Estuary should be promoted
2. Misunderstanding between fish farmers and the Reserve
3. Reserve escalates the conflict
4. Fish farming is compatible with nature conservation
5. Fences should be allowed
6. Otters are a threat to fish farms
7. Pollution from industries is a major problem
8. Lack of well defined rules for aquaculture
9. Reserve lacks means to enforce the law
10. Cormorants are the real threat to fish farming
11. Aquaculture is an activity with potential
12. Fish farmers should get monetary compensations for otter predation
13. Only extensive fish farming is compatible with nature conservation

In general, environment actors don't see otters as threat to fish farmers as they don't believe that fences should be allowed (5, 6). Affected or not by their feeling towards fish farming, they don't see any potential in the activity as they don’t think it should be promoted (1, 11). The lack of well defined rules for aquaculture and the lack of means to enforce the law within the Reserve are amongst the most important themes for these actors, as they naturally believe that some of the problems are the consequence of these two (6, 13). The water pollution and the cormorant’s predation issues seem not to gather the same consensus as other questions. The theme with the greatest importance within this group seems to be the compatibility of fish farming with nature conservation, since the consensus is toward the non existence of this compatibility. However, the opinions are not the same if we are talking about extensive fish farming, as some actors in this group believe that fish farming is compatible only in an extensive perspective.

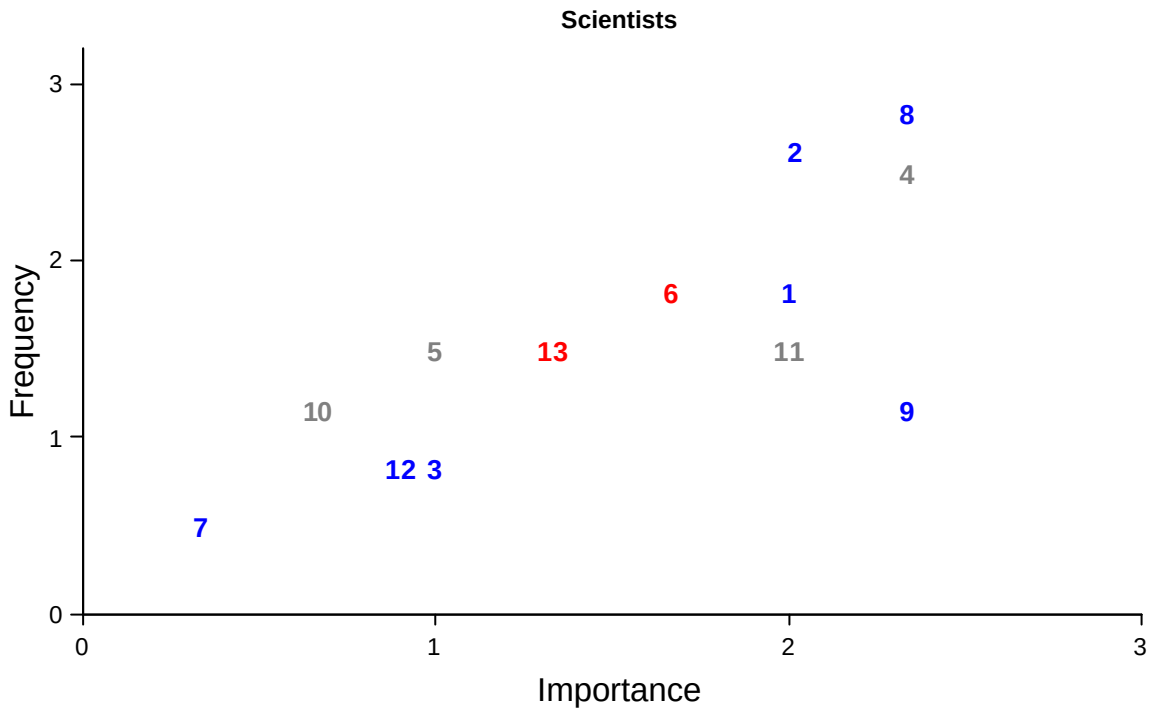


Figure 6.6: Opinions among scientists

1. Quality of fish in Sado Estuary should be promoted
2. Misunderstanding between fish farmers and the Reserve
3. Reserve escalates the conflict
4. Fish farming is compatible with nature conservation
5. Fences should be allowed
6. Otters are a threat to fish farms
7. Pollution from industries is a major problem
8. Lack of well defined rules for aquaculture
9. Reserve lacks means to enforce the law
10. Cormorants are the real threat to fish farming
11. Aquaculture is an activity with potential
12. Fish farmers should get monetary compensations for otter predation
13. Only extensive fish farming is compatible with nature conservation

The science group, as it is a group of stakeholders without a direct interest in the conflict, does not have a consensual perspective based in a common interest as other groups have. Therefore, a common interpretation on these group perspectives does not make sense at first start. Nevertheless, there are some common points. The point that sorts out to be the most important is related to the Reserve's procedures, as they agree on the facts that there is a lack of well defined rules, that the Reserve lacks means to enforce the law, that there is misunderstanding between fish farmers and the Reserve and that the Reserve escalates the conflict (2,3,8,9). In what concerns predation although there is a consensus around the otter not being a threat to fish farming, there are not clear statements about whether fences should be allowed or not (5,6). They believe that quality of fish should be promoted though they don't seem to recognize aquaculture's potential (1,11).

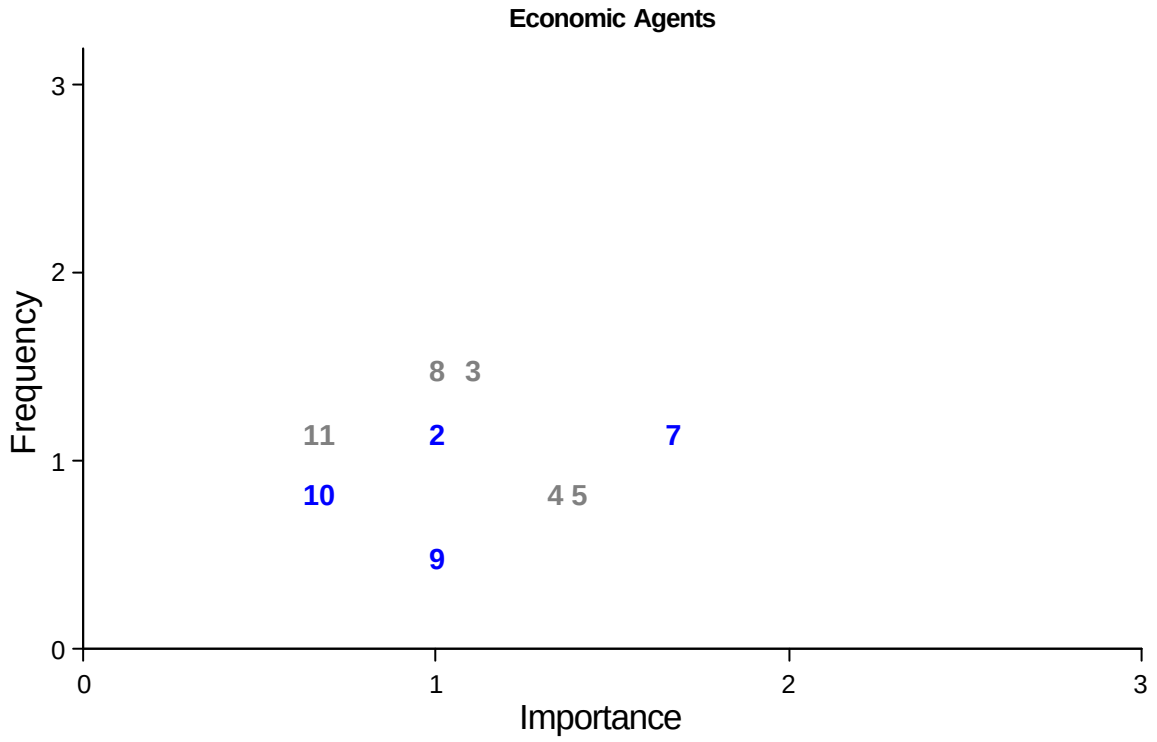


Figure 6.7: Opinions among economic agents

1. Quality of fish in Sado Estuary should be promoted
2. Misunderstanding between fish farmers and the Reserve
3. Reserve escalates the conflict
4. Fish farming is compatible with nature conservation
5. Fences should be allowed
6. Otters are a threat to fish farms
7. Pollution from industries is a major problem
8. Lack of well defined rules for aquaculture
9. Reserve lacks means to enforce the law
10. Cormorants are the real threat to fish farming
11. Aquaculture is an activity with potential
12. Fish farmers should get monetary compensations for otter predation
13. Only extensive fish farming is compatible with nature conservation

As the group of economic agents contains actors from different areas of business, most likely they will contain differences in their discourse which reflects such fact. Then again we notice the perception of the conflict with the Reserve, in what regards the misunderstanding and the lack of means to enforce the law (2,7). There's also some consensus in what concerns pollution (though there is not any agent from industries in this group), and also towards cormorant's predation (7,10). Although the fact of the otter being a threat or not is not referred, there are some opinions about the fences issue which are not very consensual (5). These actors also question if the aquaculture is an activity with potential and compatible with nature conservation (4,11).

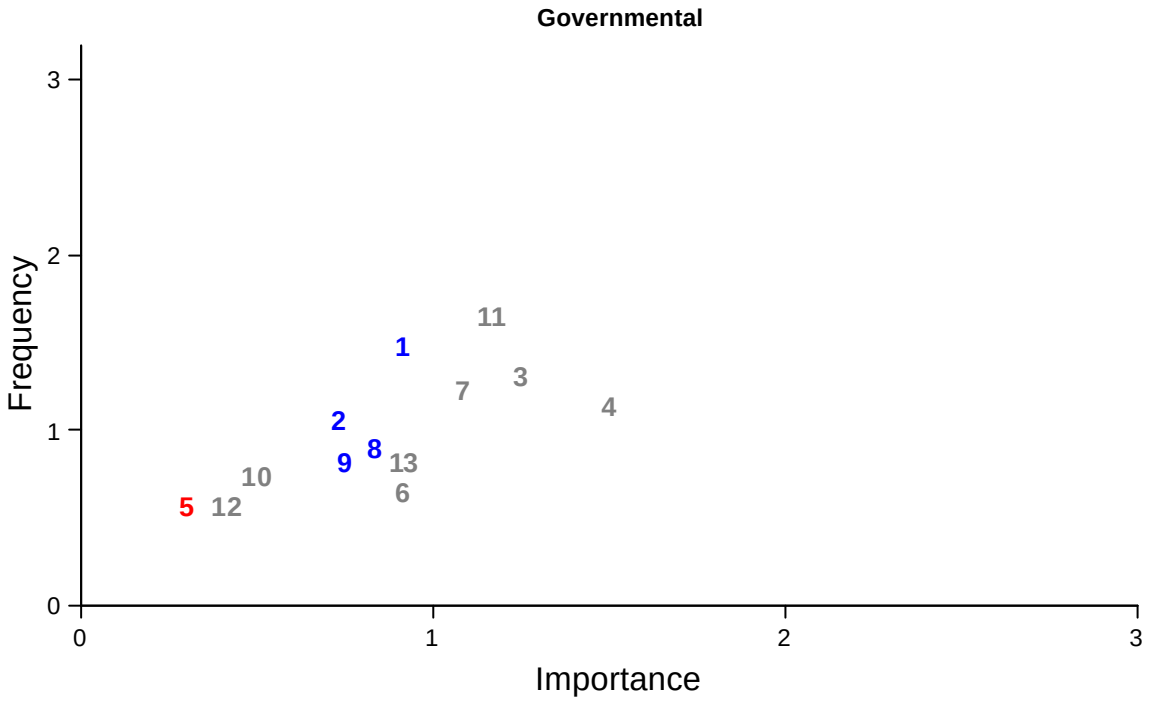


Figure 6.8: Opinions among governmental stakeholders

1. Quality of fish in Sado Estuary should be promoted
2. Misunderstanding between fish farmers and the Reserve
3. Reserve escalates the conflict
4. Fish farming is compatible with nature conservation
5. Fences should be allowed
6. Otters are a threat to fish farms
7. Pollution from industries is a major problem
8. Lack of well defined rules for aquaculture
9. Reserve lacks means to enforce the law
10. Cormorants are the real threat to fish farming
11. Aquaculture is an activity with potential
12. Fish farmers should get monetary compensations for otter predation
13. Only extensive fish farming is compatible with nature conservation

As the group of actors from governmental entities is the biggest and gathers people from a large spectrum of entities it will most likely not gather special consensus around any issue. Nevertheless, all the themes are focused and there seems to be a tendency in some of the points. First of all, everyone seems to agree and to give great importance to the fact that aquaculture quality should be promoted in the Sado Estuary (1). This could be understood as a

good sign, as if that fact can really contribute to solving some of the problems that aquacultures deals with in the estuary, it seems to gather consensus around a bunch of important actors in such a process (quality recognition or certifications). Surprisingly, even if actors from the Nature Conservation Institute belong to this group, there seems to be a tendency to agree with the difficulties that the Reserve has to deal with several problems: the misunderstanding with fish farmers, the lack of well defined rules for fish farming and the lack of means of the Reserve to enforce law. Besides the former themes, we can only find consensus against the setting of fences around fish farms, even though there are themes related to that issue that do not generate consensus (5).

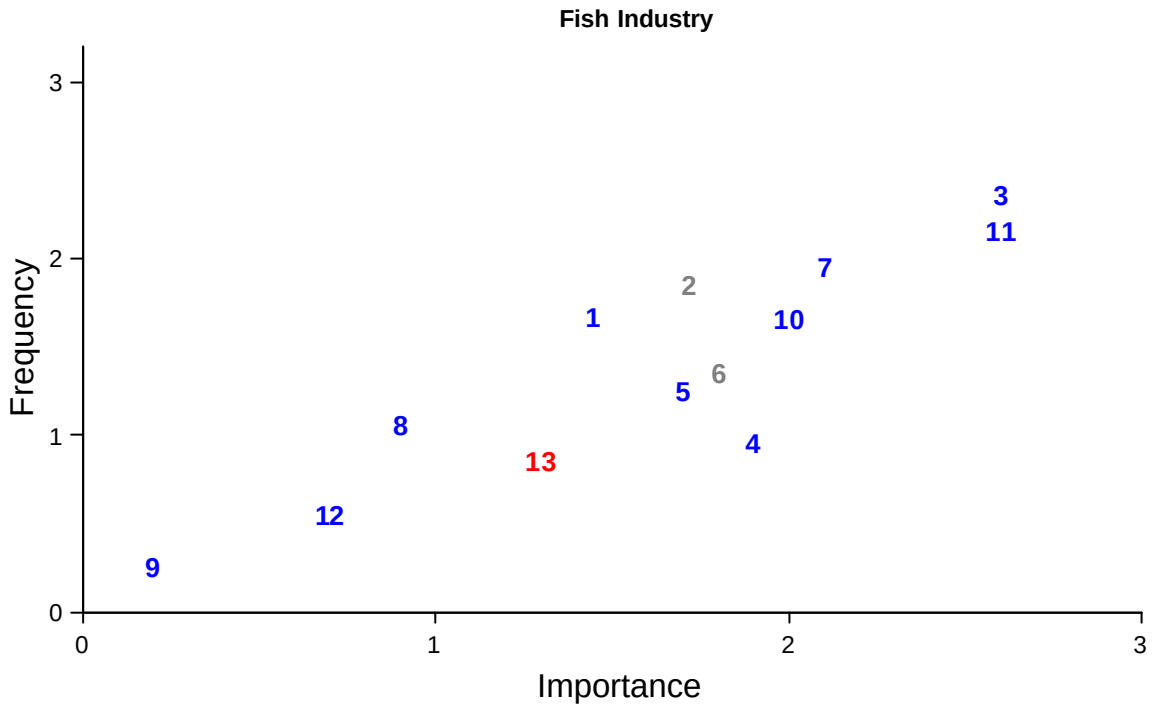


Figure 6.9: Opinions among the fish industry

1. Quality of fish in Sado Estuary should be promoted
2. Misunderstanding between fish farmers and the Reserve
3. Reserve escalates the conflict
4. Fish farming is compatible with nature conservation
5. Fences should be allowed
6. Otters are a threat to fish farms
7. Pollution from industries is a major problem
8. Lack of well defined rules for aquaculture
9. Reserve lacks means to enforce the law
10. Cormorants are the real threat to fish farming
11. Aquaculture is an activity with potential
12. Fish farmers should get monetary compensations for otter predation
13. Only extensive fish farming is compatible with nature conservation

Fish farmers seem to be the most consensual group in general terms, as there are only two themes where there is not a clearly defined position. The first would be the misunderstanding with the Reserve, as naturally, some of them would not want to assume that the lack of communication is due to a misunderstanding problem, and prefer to think that it is an

unilateral problem from the other side (2). Also, as noticed before, there is not any consensus around the otter predation issue, as some of the fish farmers believe that the otter is not a problem for the viability of their activity (6). The theme that expresses that only extensive fish farming is compatible with nature conservation also gathers a consensus against it, as all fish farmers defend that all kinds of density produced can be compatible with nature conservation (13). All the other themes, as they are facts that could be expressed by any fish farmer, gather a positive consensus around them.

At first sight there seems to exist great variabilities within the different base groups, as actors in a same group differ radically in their point of views. Fish farmers are probably the group where this happens less, as they share the very same interests at the same scale, which may not happen often in other groups. To assess how extended are the differences between these groups, we shall calculate the variability within them. In order to do this, we shall use the following scale:

Agreement (blue): 1

Not clear agreement or disagreement (gray): 0

Disagreement (red): -1

For each group, a standard deviation per theme will be calculated. In the end, we will consider the variability within the group as the mean of the standard deviations of the themes. We get the results presented in Table 6.9.

Table 6.9: Average variability within base groups

	Environmentalists	Scientists	Economic Agents	Governmental	Fish Industry
Size (actors)	4	3	2	12	10
Average variability	0.57	0.32	0.85	0.73	0.37

As said at the beginning, now remains the question: will we get groups with lower variability if we reorganize them and mix together actors from different base groups?

A factor analysis may help us to find correlation between the actors in what concerns their agreement/disagreement towards the themes. The main applications of factor analytic techniques are: (1) to reduce the number of variables and (2) to detect structure in the relationships between variables, that is to classify variables. Therefore, factor analysis is applied as a data reduction or structure detection method (the term factor analysis was first introduced by Thurstone, 1931).
In our specific case, we needed to look for relationships between variables. In order to do this, we decided to perform a principal component analysis, where we start as pre-defining how many factors we need in our analysis. For each stakeholder, there will be one factor amongst the others that will explain better the variance within that stakeholder. Afterwards, we have grouped stakeholders according to which factor explains better each one of them. This means that if stakeholder 1 and stakeholder 2 are better explained by factor 2, then they should both be in the same group.
In order to define how many factors we need, there are two known methods: the Kaiser *criterium*, where you only consider factors with an *eigenvalue* greater than 1; and the Scree test, where you have a graphical representation of how the factors' *eigenvalue* decreases as

you increase factors, and which consists to find the place where the smooth decrease of *eigenvalues* appears to level off to the right of the plot.

Table 6.10: Variance explained by components

1	2	3	4	5
2.909	1.894	1.482	1.395	0.837

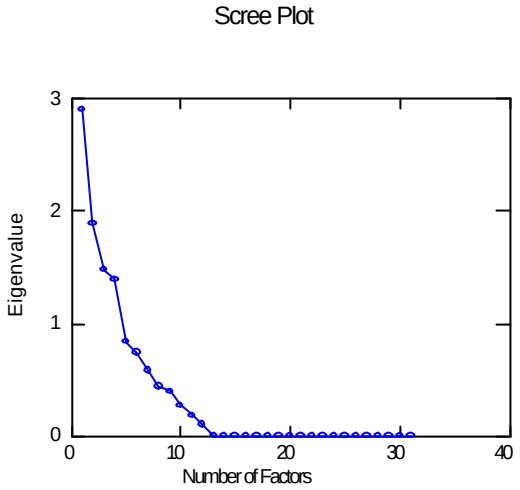


Figure 6.10: Scree Plot

As we can see from figure 6.10, Kaiser method give us four factors, as where Scree method give us more than ten factors, although the graphic is not very clear. As the number of new groups formed will be the same as the number of factors, we will choose five factors, as that is the number of base groups from which we started.
In Table 6.111, we give an example on how the component loadings table looks like. As we see in the table, the factor that has the greater absolute value for a specific stakeholder is the one that better explains its variance.

Table 6.11: Component loadings

	1	2	3	4	5
G1	**-0.404**	0.388	-0.036	0.349	0.156

Nevertheless, this method as a severe limitation, as the greater the factor is, the less reliable is his contribute to explain the variance.

Table 6.12: Size and variability of the PCA groups

	Group 1	**Group 2**	**Group 3**	**Group 4**	**Group 5**
Size (actors)	9	6	6	5	3
Average variability	0,54	0,51	0,64	0,58	0,46

Table 6.13: Mean of average variabilities between the base and PCA groups

	Base Groups	PCA Groups
Mean of the average variabilities	0,57	0,55

As we see from Table 6.13, the average variability within groups has decreased in the new groups arrangement. Nevertheless it has not been a significant decrease, as the solution that it gets is not the most optimized one and has severe limitations as stated above. Nevertheless, it can be a good statistical method for such a procedure, if afterwards, with an analysis based on this and also on the analysts perceptions from the interview, we try to re-arrange actors into five new groups. Shifting some actors from group to group, according to what was the perception given by the discourse analysis, we managed to re-arrange the actors into the groups defined in Table 6.15 and with the average variabilities calculated in Table 6..

Table 6.14: Average variability within the mixed groups

	Group 1	Group 2	Group 3	Group 4	Group 5
Size (actors)	9	7	5	6	4
Average variability	0.33	0.55	0.58	0.53	0.14

Table 6.15: Composition of the mixed groups

Group 1	Group 2	Group 3	Group 4	Group 5
C1	E3	A1	A4	C3
G12	G4	A2	C2	E2
G8	G5	A3	G7	G2
G9	P2	G1	G3	G6
P1	P3	G11	G10	
P4	P6		P5	
P8	P7			
P9				
P10				

Now, if we compare the mean of the average variabilities for each of the arrangements, we get the results presented in Table 6.16.

Table 6.16: Comparison of the means of average variabilities between base groups and mixed groups

	Base Groups	Mixed Groups
Mean of the average variabilities	0.57	0.42

We state that there is in fact a significant decrease on variability, which can be explained by the analysis of figures 6.11 to 6.14.

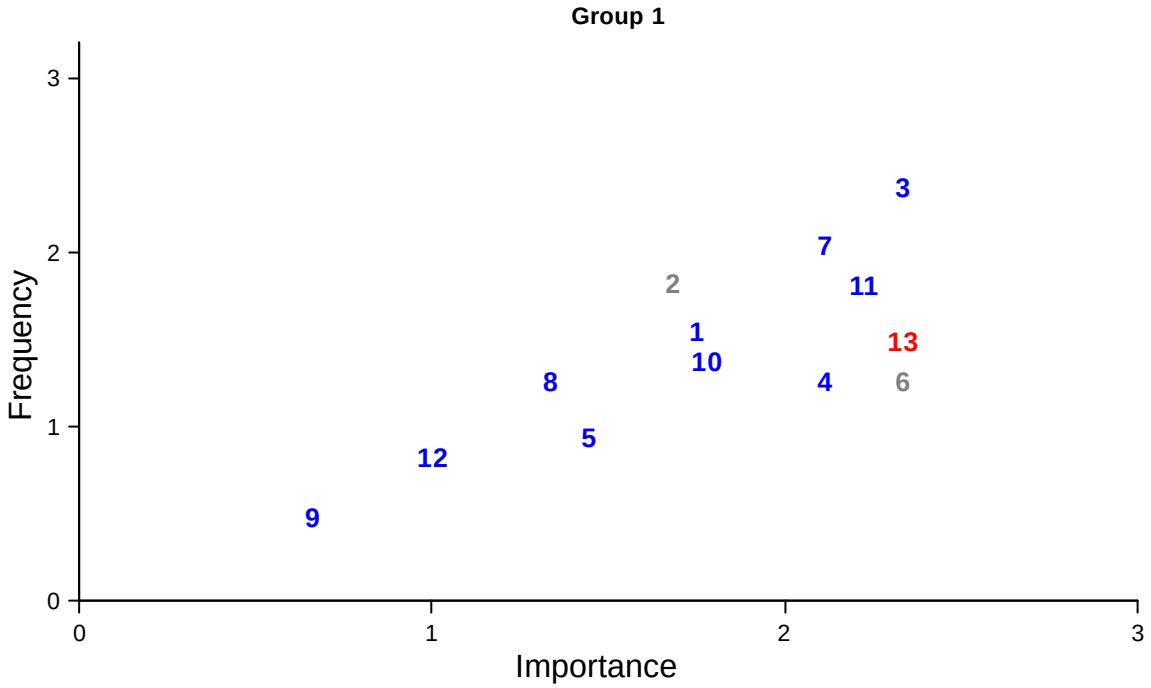


Figure 6.10: Opinions among Group 1

1. Quality of fish in Sado Estuary should be promoted
2. Misunderstanding between fish farmers and the Reserve
3. Reserve escalates the conflict
4. Fish farming is compatible with nature conservation
5. Fences should be allowed
6. Otters are a threat to fish farms
7. Pollution from industries is a major problem
8. Lack of well defined rules for aquaculture
9. Reserve lacks means to enforce the law
10. Cormorants are the real threat to fish farming
11. Aquaculture is an activity with potential
12. Fish farmers should get monetary compensations for otter predation
13. Only extensive fish farming is compatible with nature conservation

Figure 6.11 is very similar to the fish farmers figure (all the agree/disagree colours match), as five of its nine actors are fish farmers, but the interesting point in this figure is to notice who are the other stakeholders who positioned themselves so close to the fish farmers statements. In this group we can find three governmental actors, two of them belonging to institutions related with fisheries (G8 and G12, respectively IPIMAR and DGPA), and one belonging to the ICN, but at a local level, which are the Reserve rangers (G9). We could easily understand the position of the Reserve rangers, as they are the Reserve actors that deal more directly with fish farmers and fish farming in their daily life, and therefore are more sensitive to their problems. At last, we also have one science actor, which are biologists working on the field

on the otter issue with the fish farmers cooperation, therefore more aware of their reasons.

It is important to remark that the position of the several themes on the scale of the importance and frequency has remained almost the same compared with the fish farmers' figure. The only remarkable shift has taken place by the theme 13, which considerably increases in importance, which means that probably actors that not fish farmers gave a greater importance to this theme. All the actors in this group disagree on this theme, but, as the analysis of this theme must always be compared with theme 4 (as the red colour is ambiguous, because it can mean that fish farming is never compatible, or it is always compatible), by doing so, we conclude that all actors mean that every system is compatible, except for one (G9) that disagrees on theme 4. Another interesting point in this group is that almost all the fish farmers contained in it are characterized for being politically active and/or have a superior education degree (P1, P8, P9, P10), unlike almost the others that were kept out of this group.

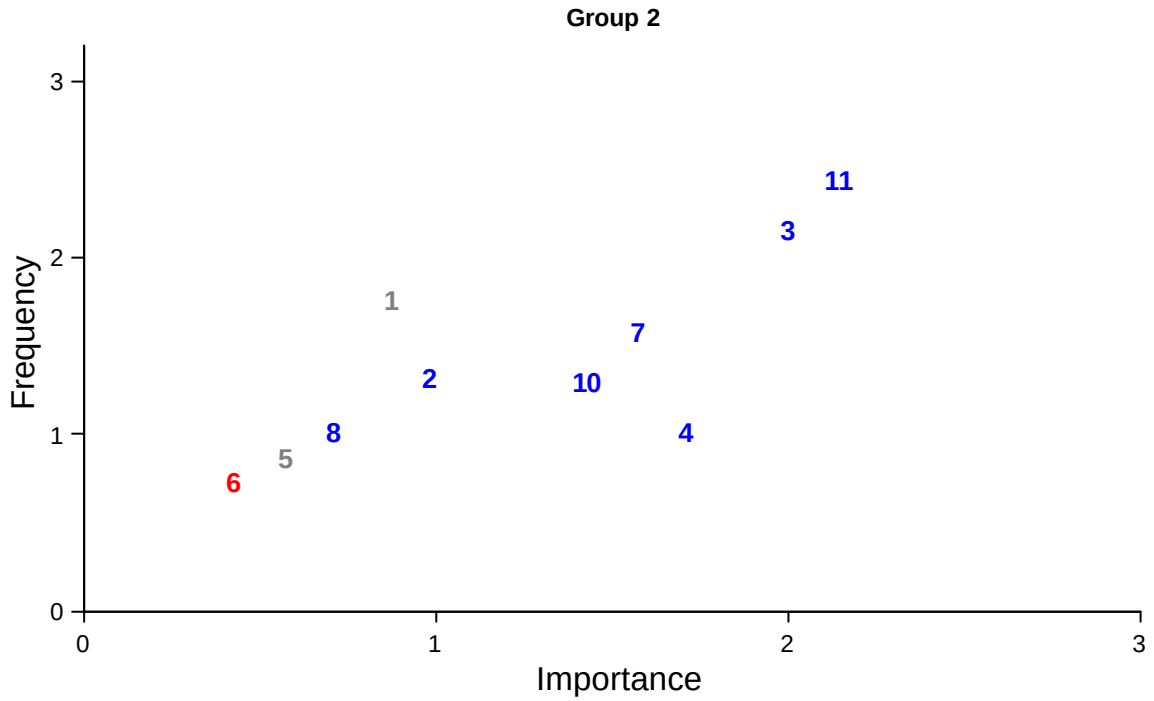


Figure 6.11: Opinions among Group 2

1. Quality of fish in Sado Estuary should be promoted
2. Misunderstanding between fish farmers and the Reserve
3. Reserve escalates the conflict
4. Fish farming is compatible with nature conservation
5. Fences should be allowed
6. Otters are a threat to fish farms
7. Pollution from industries is a major problem
8. Lack of well defined rules for aquaculture
9. Reserve lacks means to enforce the law
10. Cormorants are the real threat to fish farming
11. Aquaculture is an activity with potential
12. Fish farmers should get monetary compensations for otter predation
13. Only extensive fish farming is compatible with nature conservation

In Group 2 (figure 6.12), we can find almost all the actors connected to the fish industry who were not included in group 1. In this group there is not a consensus about promoting the quality of Sado estuary fish, as some disagree, and others are not sure that it would be a good solution. A not so clear position is also patent in theme 5, where some stakeholders don't talk about theme and others are not consensual about it. Though it seems we have a consensus on this group that indicates that otter is not the threat some fish farmers point out. The other themes gather consensus around the facts they present, as it would be expectable in a group mainly composed by fish farmers. However it is important to analyse why other actors apart from fish farmers cluster in this group. Group 2 also contains two governmental, and an economic agent, who besides being a salt producer, is also a fish farmer, which explains his tendency to fish farmers positions. In what concerns the other two actors, we have a member of a municipal environment department and the CEO of APSS. They both converge to some of the themes that emphasize the aquaculture potential and nature compatibility and the need to strengthen the activity (1, 4, 11). However they are more reticent in blaming the Reserve in some points and do not have a clear position in what concerns theme 7, as they are related professionally to some industries in the area.

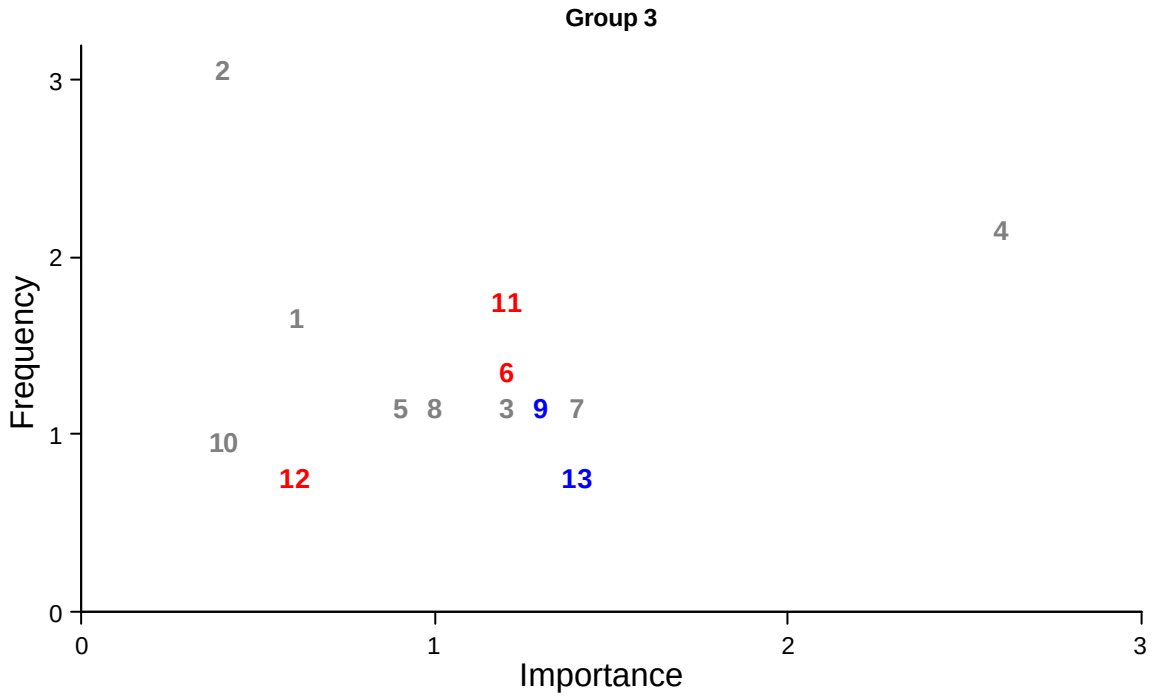


Figure 6.12: Opinions among Group 3

1. Quality of fish in Sado Estuary should be promoted
2. Misunderstanding between fish farmers and the Reserve
3. Reserve escalates the conflict
4. Fish farming is compatible with nature conservation
5. Fences should be allowed
6. Otters are a threat to fish farms
7. Pollution from industries is a major problem
8. Lack of well defined rules for aquaculture
9. Reserve lacks means to enforce the law
10. Cormorants are the real threat to fish farming
11. Aquaculture is an activity with potential
12. Fish farmers should get monetary compensations for otter predation

13. Only extensive fish farming is compatible with nature conservation

In figure 6.13 we can find the actors which have a more conservationist perspective, as besides having two members from ICN (one at national level and a technician at local level), we have three environmentalists. Almost all of them agree that, aquacultures, to exist, must be extensive, as they defend it is the only way to fit together this activity with nature conservation (4,13). Except for the ICN members, who do not pronounce themselves on this issue, they all agree that the Reserve lacks means to enforce the law (9). All of them strongly disagree that the otter is a threat to fish farming (6) and that aquaculture is an activity with potential (11). As in other groups, theme 12 is not brought up frequently, but it is important to remark that the ICN member at national level, which is the actor who could have more relevance in putting in practice a damage compensation system for otter predation, strongly disagrees with this measure. All the other themes do not seem to gather any consensus, with special relevance to theme 2, which even if it is not important, is brought up to the discourse more frequently than any other theme.

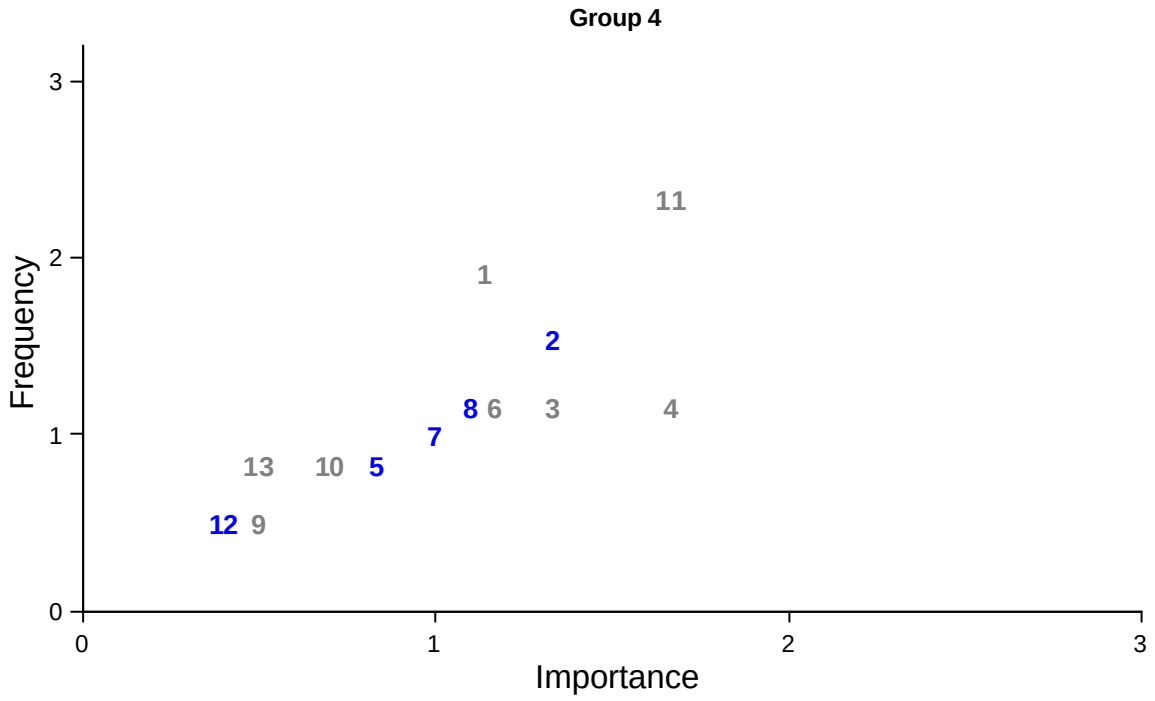


Figure 6.13: Opinions among Group 4

1. Quality of fish in Sado Estuary should be promoted
2. Misunderstanding between fish farmers and the Reserve
3. Reserve escalates the conflict
4. Fish farming is compatible with nature conservation
5. Fences should be allowed
6. Otters are a threat to fish farms
7. Pollution from industries is a major problem
8. Lack of well defined rules for aquaculture
9. Reserve lacks means to enforce the law
10. Cormorants are the real threat to fish farming
11. Aquaculture is an activity with potential
12. Fish farmers should get monetary compensations for otter predation
13. Only extensive fish farming is compatible with nature conservation

Group 4 is perhaps the most heterogeneous group formed, as it gathers environmentalists, governmental actors, science actors and even one fish farmer. It is remarkable that they don't consensually contest any of the themes, though they consensually agree on a few. As we can see in figure 6.14, almost all of them agree that there is a misunderstanding between fish farmers and the Reserve, that pollution from other economic agents is a major problem, and that there is a lack of well defined rules (2, 7, 8).

The other consensual themes on the figure are brought up by a very few. Theme 11, even if it does not bring a consensus, it is referred by all the actors (as in the figure we can notice the higher frequency and importance of this theme towards the others), and all of them, except for one (the fish farmer), are not sure whether there is a potential or not in aquaculture. Governmental actors in this group belong to municipalities or parishes. The environment actor, could be classified as the most moderated one that has been interviewed, as in his discourse he always underlines the necessity of fitting together fish farming with nature conservation. As for the fish farmer, he fits in this group, because besides agreeing on some themes with the rest of the actors, he gets away from all the other fish farmers as he claims there is no potential in the activity and that promoting the quality of the fish would not be a solution to any problem.

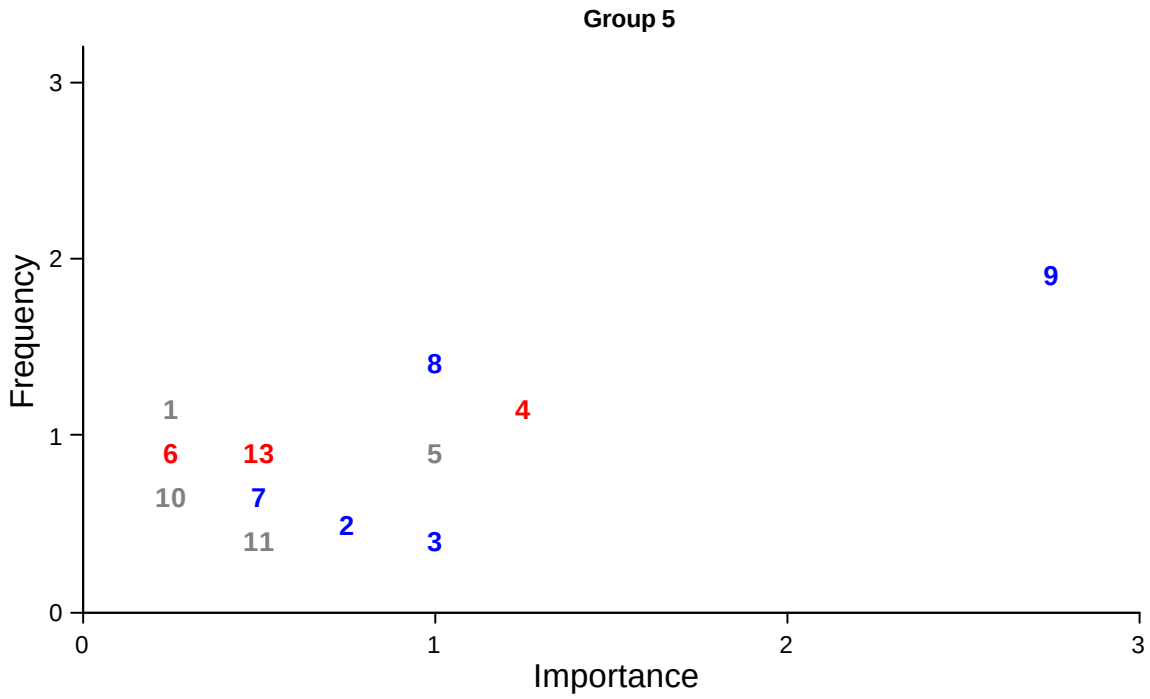


Figure 6.14: Opinions among Group 5

1. Quality of fish in Sado Estuary should be promoted
2. Misunderstanding between fish farmers and the Reserve
3. Reserve escalates the conflict
4. Fish farming is compatible with nature conservation
5. Fences should be allowed
6. Otters are a threat to fish farms
7. Pollution from industries is a major problem
8. Lack of well defined rules for aquaculture
9. Reserve lacks means to enforce the law
10. Cormorants are the real threat to fish farming
11. Aquaculture is an activity with potential

12. Fish farmers should get monetary compensations for otter predation
13. Only extensive fish farming is compatible with nature conservation

Group 5 (figure 6.15) is the less consistent group, as it gathers only four actors, of whom two of them are from the SEPNA, and rarely brought up the themes analysed, talking mostly about the lack of means to enforce the law in the Reserve (9). The other two are: a scientist with experience on natural areas management and an eco-tourism enterprise. They brought up frequently the fact that there are no defined rules for aquaculture (8) and they also both agree that not even extensive fish farming is compatible with nature conservation (4,13). However they seem to accept peacefully or do not bother with fish farmers putting fences to protect themselves from otter predation (5). All the other themes are referred only by one of the stakeholders, so they are not relevant for the group analysis.

6.3 Aggregation of opinions

In this chapter the purpose is to aggregate all the stakeholders' positions towards one theme, and then compare the themes, in order to assess which are the themes that gather wider consensus or larger disagreements. We can also assess which are the themes that are more important and which are brought up more often in general.
For this purpose, unlike the previous chapter we shall have the following key for the colors in the graphic:
Light Blue - Most of the stakeholders agree on the theme, and none disagree.
Blue - The majority of the stakeholders agree, thus some disagree.
Grey - There is no clear tendency towards the agreement or disagreement.
Red - Stakeholders are divided between agreeing, disagreeing and undefined positions.
Light Red - The situation is very close to fifty-fifty between agreeing and disagreeing.

Table 6.9: Aggregation of opinions for the different themes

Topic Code	Topic	Imp	Imp (rel)	Freq	Freq (rel)	Avg	Consensus						
							Red		Gray		Blue		
							N	%	N	%	N	%	
1	Quality of fish produced in the Sado Estuary should be promoted	1.0	1.8	1.5	2.8	0.93	2	11%	4	22%	12	67%	
2	There is a misunderstanding between fish farmers and the Reserve	1.1	1.9	1.4	2.6	0.94	0	0%	7	44%	9	56%	
3	The Reserve escalates the conflict	1.7	2.7	1.4	2.7	0.83	4	15%	5	19%	17	65%	
4	Fish farming is compatible with nature conservation	1.8	3.0	1.1	2.2	0.6	6	24%	4	16%	15	60%	
5	Fences should be allowed	1.0	1.7	0.8	1.6	0.44	3	20%	5	33%	7	47%	
6	Otters are a threat to fish farms	1.2	2.0	0.9	1.9	-0.22	9	39%	8	35%	6	26%	
7	Pollution from industries is a major problem	1.4	2.4	1.2	2.3	1.32	0	0%	4	21%	15	79%	
8	There's a lack of well defined rules for aquaculture	1.0	1.8	1.0	2.0	1.42	1	5%	1	5%	18	90%	
9	The Reserve lacks means to enforce the law	0.8	1.5	0.5	1.3	1.28	0	0%	3	23%	10	77%	
10	Cormorants are the real threat to fish farming	1.1	1.9	0.9	1.9	0.88	2	12%	4	24%	11	65%	
11	Aquaculture is an activity with potential	1.7	2.7	1.7	3.0	0.58	5	19%	7	27%	14	54%	
12	Fish farmers should get monetary compensations for otter predation	0.5	1.0	0.3	1.0	1.11	1	17%	0	0%	5	83%	
13	Only extensive fish farming is compatible with nature conservation	1.0	1.8	0.7	1.5	-0.71	9	64%	2	14%	3	21%	

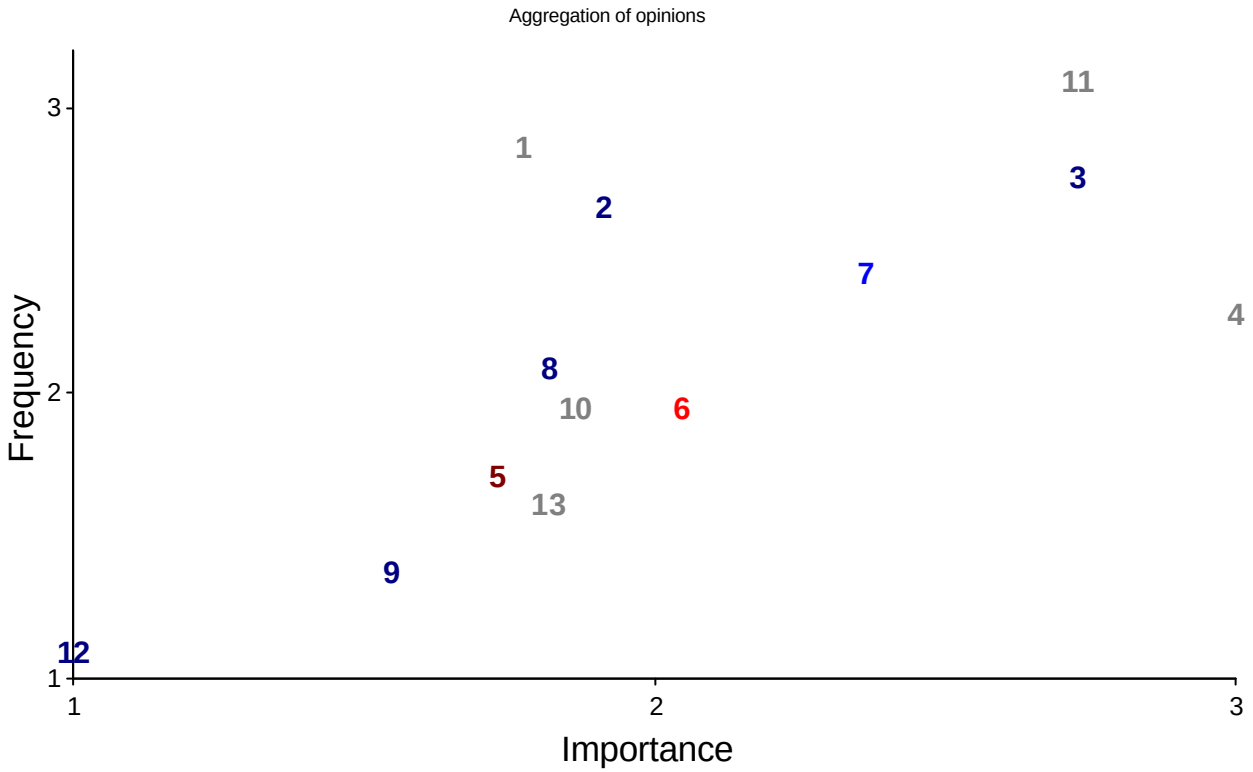


Figure 6.15: Aggregation of opinions for the different topics

From the analysis of the aggregation graphic (figure 6.16), we can have a clear overview on the importance and degree of consensus of the analysed issues. Both the potential of aquaculture (11) and its compatibility with nature conservation (4) are issues that recurrently appear in the discourse of the stakeholders with a very high importance. These two issues alone can be seen as fundamental to decisions concerning the future developments on aquaculture regulation, investment and support.

Looking right after these themes in terms of importance we can see two relatively consensual issues – pollution from industries is a major problem (7) and the reserve is escalating the conflict (3). Regarding the first one, no stakeholder has disagreed with this and half of the stakeholders interviewed have pointed out to this problem. It appears frequently related to non-compliances with the rules imposed on economic activities within the Reserve. At the same time, most stakeholders and more prominently the fish farmers have expressed that the Reserve is escalating the conflict by disregarding and blocking the aquaculture activity. This leads us to consider that any work for conflict resolution that will involve the different groups of stakeholders, especially fish farmers and the Reserve, will have to look deeply into these issues.

The most controversial topics are the ones directly concerned with the otters, namely otters' predation (6) and the allowance of fences as a mitigation measure (5). It is obvious that the latter is directly correlated with the former in the way that fences only make sense when there is an idea that the predation caused by otters is prejudicial to the activity. There is a complete division between the stakeholders in what concerns the impacts of otters' predation. This issue should also take into account the opinions expressed about the other major predator – the cormorant (10). We can see that a big part of the stakeholders consider the cormorants a bigger threat to fish farms than the otter.

Fish quality (1) is one of the topics that is most referenced by stakeholders. There are different reasons for this, according to the specific interests of each stakeholder group. Some see it as a solution to the reducing profit margins, others as a way to keep the activity at low intensities of production. Most people think that quality of fish from aquacultures in the Sado estuary can and should be promoted, but some think it will not be possible to explore such a possibility.
The topic of monetary compensations comes really into the bottom left corner. This position reflects the lack of mention of this measure in the discourse of the stakeholders. However, most of the 6 stakeholders that pulled this issue in the interviews consider it as a very important issue.

6.4 Alignment of Stakeholders

In this section we will look into detail at the most important storylines, trying to describe the most important patterns in each figure. This analysis will allow us to develop clusters of agreement in the different themes, which will be essential for the work in WP10.

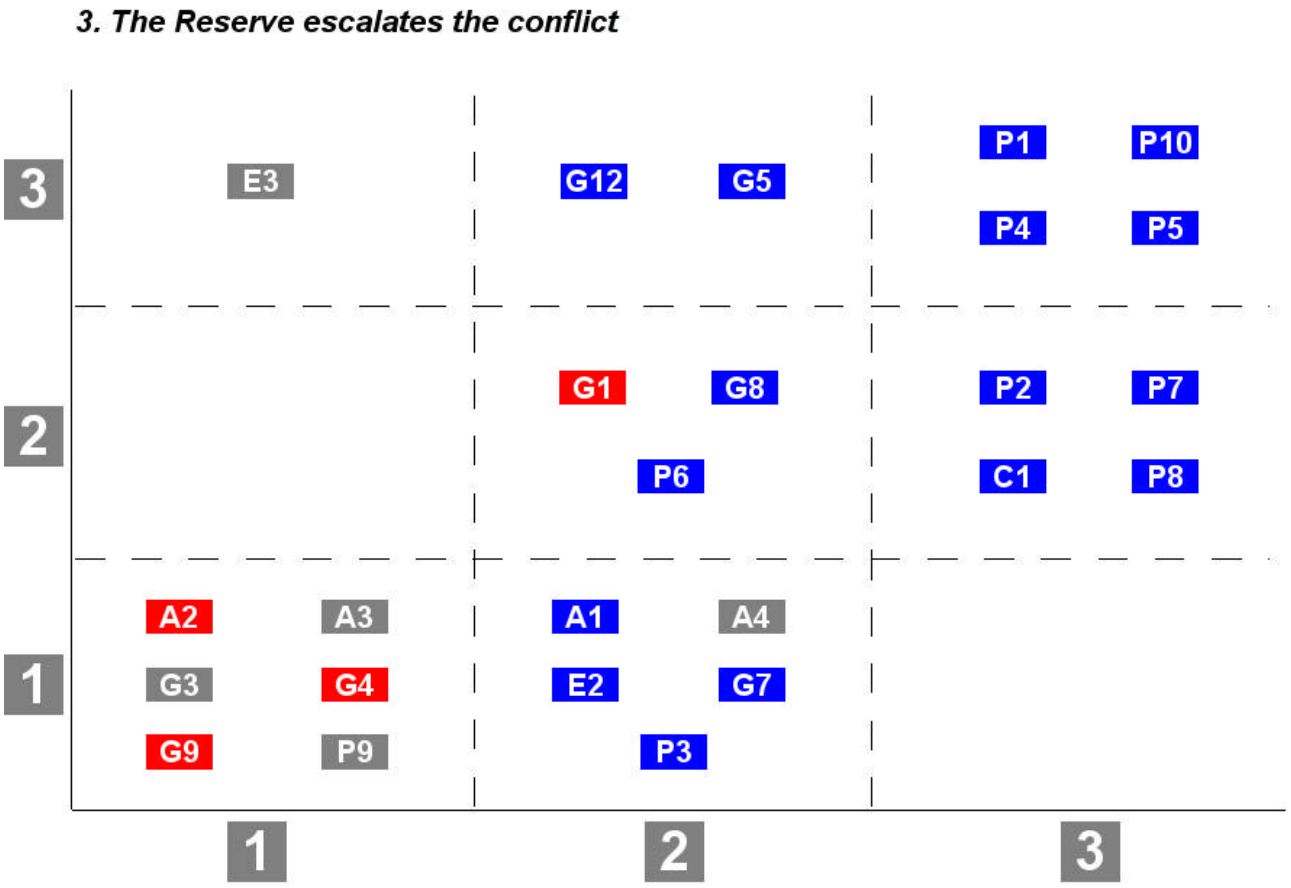


Figure 6.16: Theme 3

The escalation of the conflict by the Reserve is one of the issues that fish farmers constantly point out. By looking at figure 6.17 we can see a blue cloud of fish farmers in the upper right corner. This opinion is shared by some governmental stakeholders, coming both from the fisheries area (G8, G12) and from the municipalities (G5, G7). One of the science stakeholders (C1) also feels that there is an escalation of the conflict connected with the Reserve attitude and clusters with the fish farmers in this theme.

On the other hand, we can see that the two fish farmers that come from another association (P9 and E3) only agree partly with this topic. This is due to the fact that this association has been working with the Reserve, while the other fish farmers no longer establish any cooperation with the Reserve.
Governmental stakeholders from RNES (G1, G9), together with the most anti-aquaculture environmentalist (A2) are the ones that more strongly oppose this argument. This leads them not to consider this as an important issue and, therefore, they come in the bottom left corner of figure 6.17.

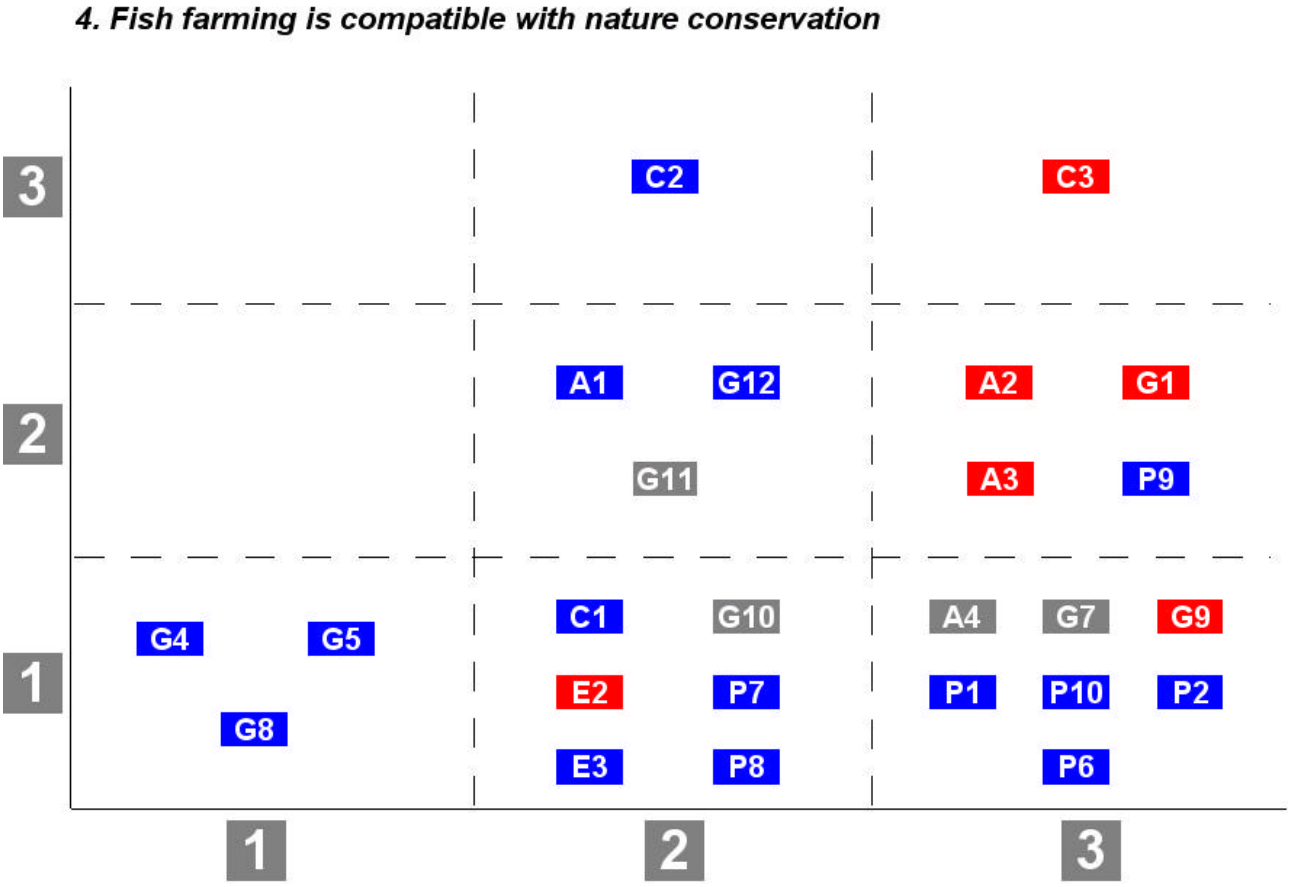


Figure 6.17: Theme 4

In figure 6.18 we can see that the stakeholders that reject the argument that aquaculture is compatible with nature conservation are the ones that most frequently pull this topic. We can cluster here two environmentalists (A2 and A3) and the Reserve itself, both at the administration (G1) and operational (G9) levels. Even though C3 considers this a very important issue, he is not an "hard-liner" in the sense that, contrarily to the other mentioned stakeholders, he tolerates fish farming and considers it can be an important activity, even to avoid an even bigger deterioration of the environment by other kinds of activities. The same goes on to E2, coming from the tourism sector.
Some fish farmers also consider this issue as of big importance. Here we can cluster 4 fish farmers that came inside Group 1 of Section 2 (P1, P8, P9 and P10) with two other fish farmers that have been practising a quite extensive activity for long in the Estuary (P2 and E3). Two scientists (C1 and C2) share the same colour of fish farmers, but the agreement on the conditions under which this compatibility happens are probably distinct.

Figure 6.18 also gives the idea that it will not be difficult to cluster the other governmental stakeholders, apart from the Reserve, with fish farmers. Even though some of them partly disagree with the topic, they don't give it too much attention. Figure 6.19 presents us with a more detailed overview on the position of stakeholders regarding the development of different types of fish farming in the Sado estuary. This analysis comes from both themes 4 and 13.

Figure 6.18: Position of stakeholders concerning the types of aquaculture

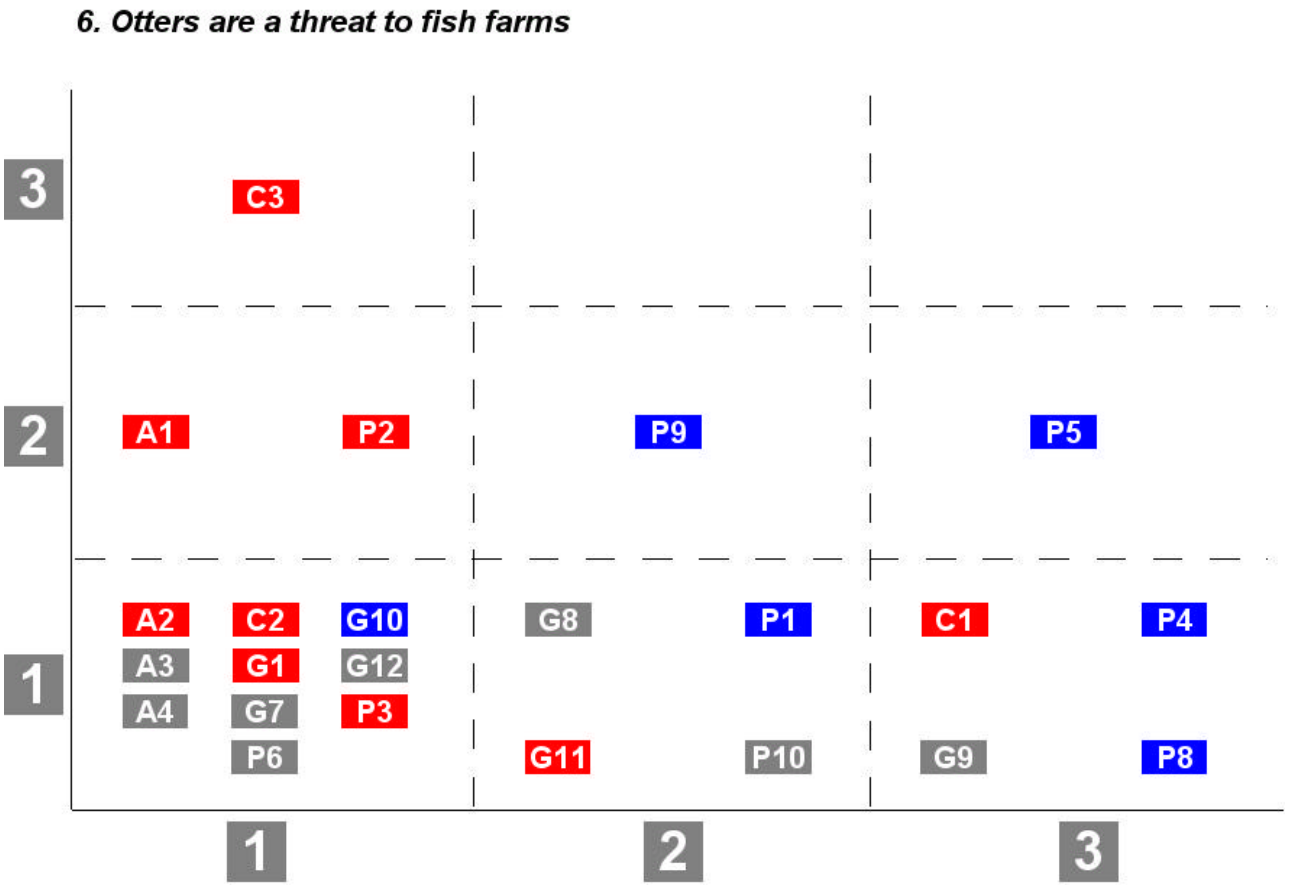


Figure 6.19: Theme 6

As we have seen in figure 6.16, the threat of otters to fish farms is the most controversial theme. In figure 6.20 we can see a big aggregation of stakeholders at the lower importance and frequency square, denoting the low importance given to this threat. These stakeholders, despite the different agreements on the theme, can be easily clustered. Even the blue box from the member of the parish (G10) should not cause a disruption of this group, due to the low importance given to it. It is curious that in this group we can include a few fish farmers that do not consider the otter as a threat – P2, P3 and P6. These are fish farmers that are either more close to the urban area and therefore is not affected by otters (P6); or that have a perception that otter predation does not significantly affect the activity, due to the characteristics of its predation (P2 and P3).

On this topic, we can create another cluster, made only by fish farmers that believe that their activity is threatened by the predation of otters. Inside this cluster we can include all the blue boxes, apart from the above mentioned G10. P1, P4, P5, P8 and P9 would come inside the group of stakeholders which agree with this topic. Among this group is the myth that otters eat up to 4 kg of fish each day.

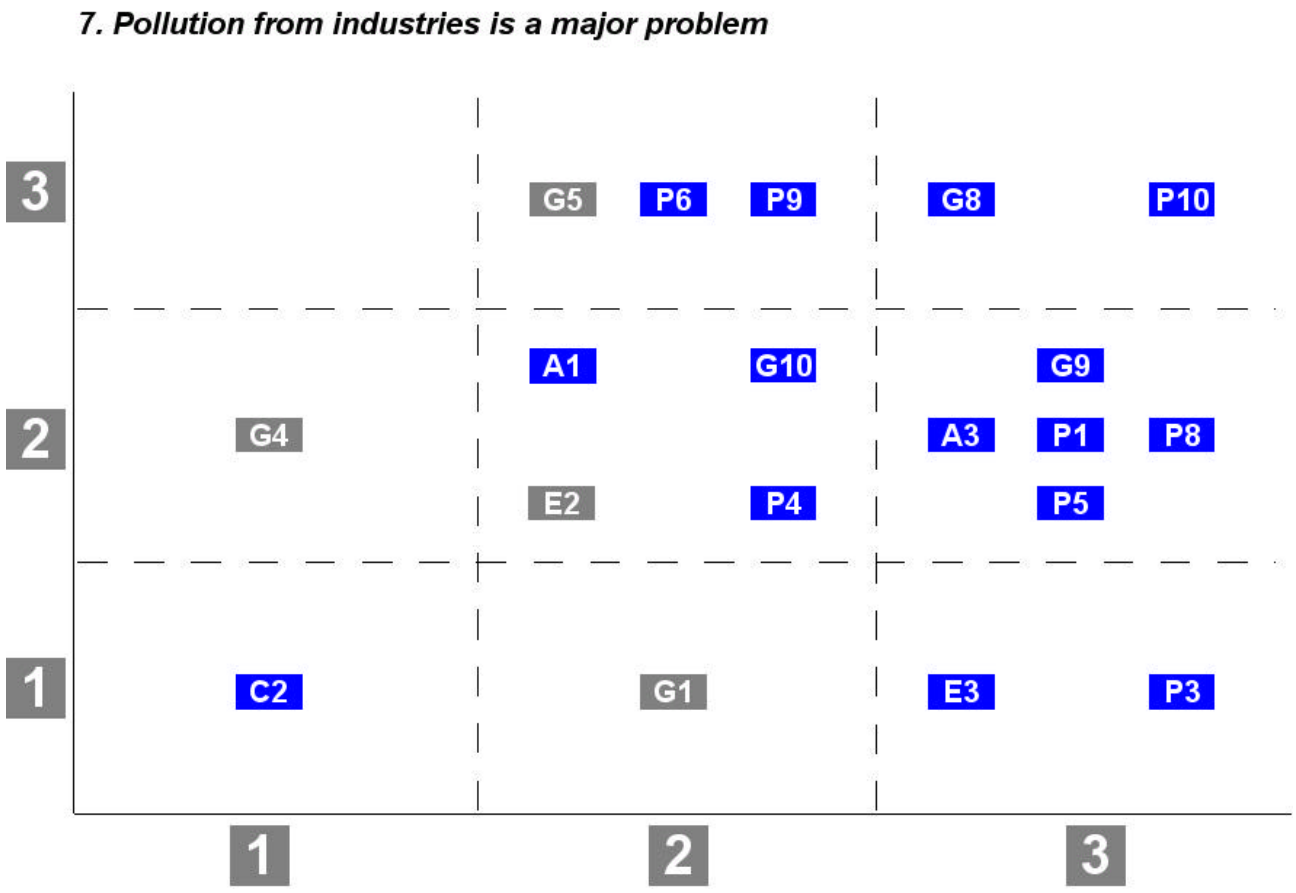


Figure 6.20: Theme 7

Figure 6.21 show one of the most consensual topics. Almost every stakeholder agrees that pollution from industries is a major problem. The importance given to this theme is transversal to different stakeholder groups. We can see fish farmers clustering with governmental stakeholders (G8, G9 and G10) and environmentalists (A1 and A3). To the fish farmers there is a general feeling of injustice when the Reserve assumes a position against the increase in fish densities, while at the same time they see industries contributing to water pollution that, ultimately, will be harmful to their aquacultures. The environmentalists A1 and

A3 are clearly less concerned with the problem of aquaculture than with the problem of industries.

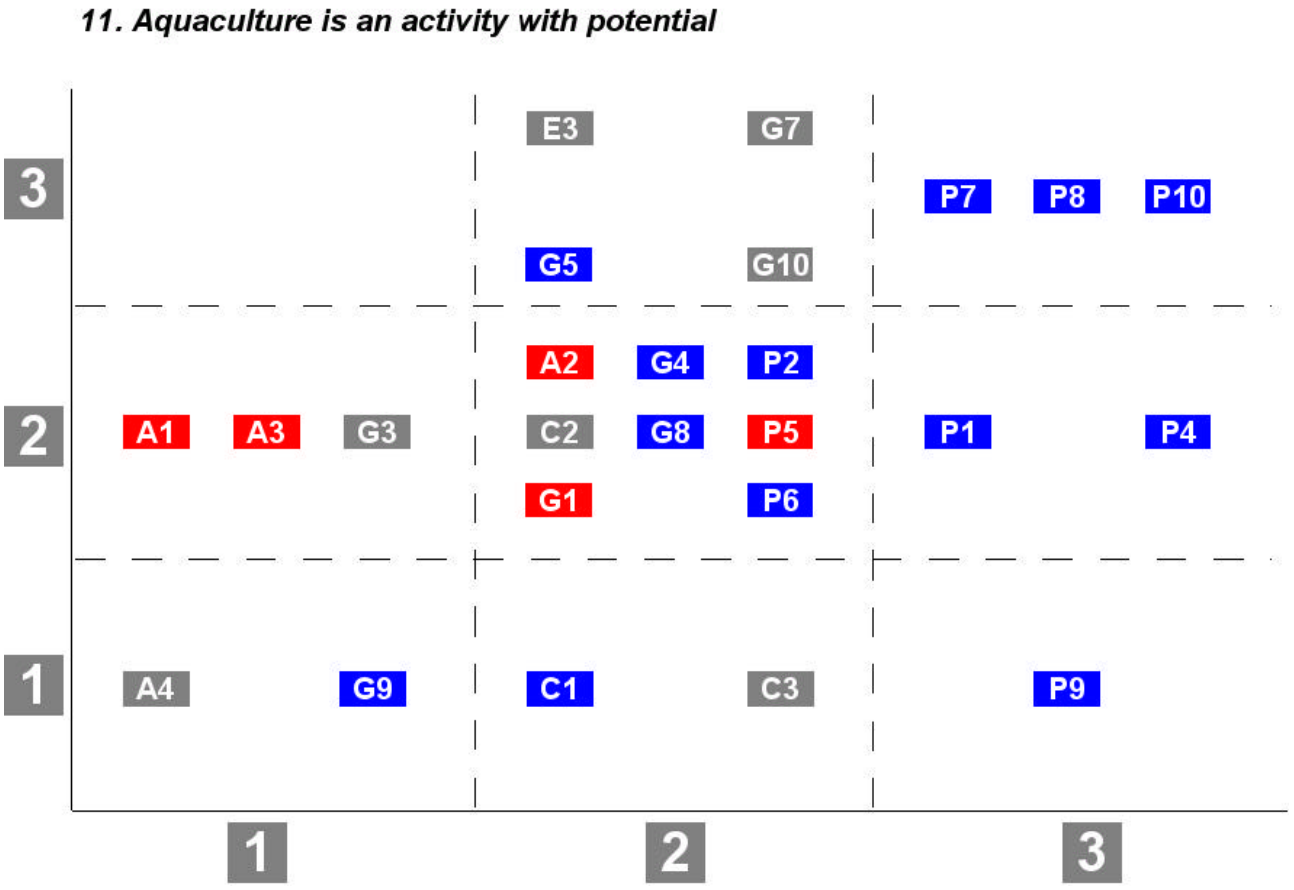


Figure 6.21: Theme 11

Figure 6.22 gives an overview on the topic of the potential of aquaculture. Once again we can see the fish farmers joining in agreement with governmental stakeholders from the areas of fisheries (G8) and municipalities (G4). There is however a fish farmer (P5) that constitutes an exception. He sees that the price of fish has been decreasing, while the costs of feed increase and an ever stronger competition from external markets, which is leading to his apprehension about the future of the activity in the Sado estuary.

It is curious that the administration of the Reserve and their rangers completely disagree on this topic. While the Rangers (G9) see aquaculture as a growing activity, the administration (G1) thinks that fish farming has a fake potential, since the market is already overcrowded with fish. The Reserve administration shares with the environmentalists (A1, A2, A3 and A4) the opinion that fish farming is an activity without future.

6.5 Conclusions

The panoply of stakeholders interviewed during WP6 gave us a quite in depth and broad knowledge of the conflict. Even though not all stakeholders have been interviewed, we got interviews with all the key stakeholders. Eventually, there is a gap in what concerns

stakeholders from the polluting industries since, as we have seen, they are strongly targeted in most of the interviews.

Along the analysis done within WP6, we could see that some of the most conflicting themes are not directly related to the conflict between otters and fish farms. However, in the present situation, they have to be taken into account, as they lie behind, if not in the source, of the conflict which we want to deal with in FRAP.

The conflict is characterised by a strong misunderstanding and, thus, escalation of the conflict between the Reserve and the fish farmers. Other stakeholders, apart from the above mentioned, don't seem to be in a close contact with the conflict. However, this situation might change, as we are in face of an erupting conflict.

There is no consensus regarding the threat of otter predation, but most fish farmers have the feeling that otters predate significantly on their fish tanks.

The conflict between otters and aquaculture in the Sado estuary can be said to be mostly of the data/facts type, since there is a strong discrepancy between what the fish farmers say and what the scientists state as facts. However, it is possible to find here the 3 other typologies of conflict.

We have a conflict on interests, where the conservation of the Reserve clashes with the expansion of fish farms. There is also a conflict between the values of nature conservation and economic development of the area. Finally, we have a strong relationship conflict between the Reserve and the fish farmers.

There is a strong cohesion between the positions and arguments of most fish farmers, but we can find a division between the two existing associations. Some of the fish farmers exert an especially strong influence over the general opinion of the fish farming community.

However, it will be important to involve most of the interested stakeholders, as there are no strong trust relationships among fish farmers, even those of the same association.

It was clear from the discourse analysis that the majority of stakeholders are more concerned with other issues than the otter predation and its conflict with aquaculture. Gathering together stakeholders for a participatory process may trigger latent conflicts and they can easily derive to agendas that are not directly related to the conflict between otters and fish farms. Therefore, the aim of the participatory process should probably be proposed the FRAP team, if we don't want the agenda to derive into other conflicts that do not fit in the context of FRAP. The objective should be agreed by all the stakeholders and written and should include a statement clearly addressing the otter-aquaculture conflict.

This might not be conspicuous, as in the first sessions the theme shall never be narrowed and all problems must be presented to the stakeholders and put into the table, as all they might lead to solving the conflict. There must be a mid-term that may not be obvious to find. Such questions must be seriously addressed by WP10 in the development of the RAP.

Regarding the participatory process, the analysis made in chapter 6.3 leads us to propose a division of stakeholders that does not lie in the base groups. The mixed groups that we have come out during this chapter may be a good source for working separately on the first phases of the process. Also, since there are very deep and strong conflicts between the stakeholders, it could be harmful for the process to make groups where we mix contrasting positions in the beginning phases.

Chapter 6.4 gives us a deeper insight on the clustering of stakeholders. Here we can see that for some specific themes, like the issue of pollution from industries, it might be possible to reach consensus between such conflicting groups as are environmentalists and fish farmers. A theme based aggregation might be used in the later phases of the process to start joining the stakeholders and finding bridges for agreement.

After these bridges have been established, confidence will hopefully increase between the stakeholders and thus allow us to focus the discussions around the most conflicting theme,

which is also the one we are mostly concerned with in the FRAP project – the threat of otters to fish farms.
The conclusions in this report and specifically the type of the conflict can probably be found in other conflicts between biodiversity and economic activities in protected areas in Portugal. This idea comes from the fact that the national model for protected areas management could be a potential driving force of the conflict, run under the umbrella of ICN. Among the most critical problems, there is the lack of management plans for almost all the protected areas in the country.

6.6 Acronyms

APSS – Administração dos Portos de Setúbal e Sesimbra (Setúbal and Sesimbra Ports Administration)
DGPA – Direcção-Geral das Pescas e Aquicultura (Directorate-General for Fisheries and Aquaculture)
ICN – Instituto de Conservação da Natureza (Nature Conservation Institute)
IPIMAR – Instituto de Investigação das Pescas e do Mar (Research Institute for Fisheries and Sea)
RAP – Reconciliation Action Plan
RNES – Reserva Natural do Estuário do Sado (Sado's Estuary Natural Reserve)
SEPNA – Serviço de Protecção da Natureza da Guarda Nacional Republicana (Nature Protection Service of the National Republican Guard)

6.7 References

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7 SWEDEN

7.1 Introduction

7.1.1 General Description of the Conflict between Grey Seal and Coastal Fishery in Sweden

The Swedish conflict originates in the rivalry between coastal fishermen and grey seal to gain access to the resource fish in coastal waters. The Baltic grey seal population was diminishing during the 1960s until the 1980s, primarily because of toxic pollution. The conflict between fishery and seal has increased as the grey seal population has re-established itself along the coast. The small scale fishermen that experience the seal damage on gear and catch are economically seen a marginalised and diminishing group. Their number is continually reducing and their age structure indicates the economic problems of the sub-sector. The average age amongst the fishermen in the model region is high: most fishermen are more than 45 years old and no young people are starting as fishermen. Many of the fishermen survive today only because they combine fishery with refinement (smoking of eel etc.) or with part time jobs elsewhere. Generally the fishermen perceive the future prospects for small scale coastal fishery as rather grim. Market prices have gone down, the species that were the traditional target species are rare, and the seals[12] are harvesting the scarce resources and damaging the gear.

The conflict seems to be quite "stable" with regard to interests articulated and stakeholder constellation, but tense for the time being. However, one should be aware that the conflict status could easily and rapidly change. This could be induced by changes related to economy that are perceived as negative to the fishermen or when the seal population should diminish again due to sickness or environmental impacts.

Not all conflicting interests are present at local level. One side, fishery, is clearly represented by the local fishermen. The other side, the protected seal, is often not seen as a stakeholder since it is not a human agent. (Whether it could be meaningful to include the seal as a stakeholder or not is an issue that should be discussed more: The theme will re-emerge during the next part of WP6 when reconciliation strategies from the stakeholders are presented.) Who is representing the grey seal on the nature conservation side at the local level? The groups that are expected to take such responsibility, the local NGOs and action groups do not exist or do not pay any interest to the conflict at this level. There are no local stakeholders that use seals as part of their marketing of tourism etc. Rather it is the "living archipelago" in a cultural sense that is being marketed in tourist pamphlets and descriptions of the coastal area, meaning that the traditional coastal fishery is part of the cultural landscape and the idea of life in the archipelago.

Since there are no visible stakeholders on the nature conservation side of the conflict at the local level, the conflict unfolds at regional and national levels, and very often within the public sector. The units of the regional administration manage the implementation of different policy areas and thereby even specific interests connected to specific groups or areas. The fishery unit gets to know coastal fishermen, their situation and problems; and the nature

[12] Even the cormorant is considered to be a threat to the small scale fishery – however the cormorants do not cause damage to the fishing gear but only eat the fish.

protection unit tries to create the best conditions for flora, fauna and especially protected species. The policies that are created at national level do not necessarily guide what should be prioritised in practice, at regional level, and the policies are not backed by the same economic or legislative incentives. As a result of this the actual conflicts unfolded at the regional level where different sectors meet to plan and implement the concrete work.

At a national level the conflict unfolds in a similar way as presented at the regional level. The Swedish Environmental Protection Agency is responsible for implementing and managing governmental decisions on nature protection policies, and the Swedish Board of Fishery is responsible for implementing and managing the fishery related policies. It is evident that the interests sometimes collide when the same resources are at stake. One could say that the Environmental Protection Agency generally advocates the perspective of the protected species, and that the Board of Fishery advocates the perspective of the human resource users. Still the division of perspectives is obviously not crystal clear: the Board of Fisheries even monitors the marine resources and preconditions – hence they can even be interested in protection of resources and species to support the aim of future sustainability. The Environmental Protection Agency shares this ambiguity: the management of species is organised in proportion to the size of the population, the damage caused by the species, international agreements to protect the species etc. Hence the Environmental Protection Agency might even at times advocate hunting in some form or other mitigation measures to relieve conflicts or manage populations. Below follows a table of the stakeholders presently involved in the conflict in the model region.

Description of the stakeholders involved in the conflict between fishery and seal in the Swedish model region.

	Fishery	**Nature conservation (seal)**
Local level	Fishermen	Seals
Regional level	*NGOs*: Coastal Fishery Organisation Swedish Hunters Association *Public sector:* Fishery unit (regional administration)	 *Public sector:* Nature protection unit (regional administration)
National level	*NGOs:* Coastal fishery organisation Swedish Hunters Association *Public sector:* Swedish Board of Fisheries	*NGOs*: WWF, Sweden Swedish Society for Nature Conservation (SNF) *Public sector:* Swedish Environmental Protection Agency

"Floating" stakeholders that influence policy processes but are not homogenous or easily placed on either side of the conflict.	Scientists involved in projects such as: "Seals and fishery" FRAP National Museum for Natural History

Source: own compilation

7.1.2 Description of Existing Mitigation Measures/Management Plans

The mitigation strategies that are implemented in the model region are determined by the National Grey Seal Management Plan (Naturvårdsverket, 2001) which outlines the management of grey seals during the five year period 2001-2005, and was formulated by the Swedish Environmental Protection Agency with the advice of the Swedish Board of Fisheries. The status of the Management plan is that of a policy document based on a review of knowledge and experience with seal management, but not a formal action programme that specifies the implementation of management measures in specific regions. It is a general description of knowledge and measures from the point of view "how to develop them further through identifying further research or development activities"? The scientific background on grey seal population development and health status was primarily supplied by the Swedish Museum of Natural History. The mitigation strategies in the plan include compensation for seal damage on catch and gear; development of seal safe gear; and protective seal hunting. Beyond these measures in the management plan (and already before the plan) there exists the designation of seal protected areas which is a controversial measure with regard to conflict mitigation, but can more be understood as a measure supporting the interests of nature protection and managing the grey seal population.

Compensation for seal damage. The Swedish Environmental Protection Agency distributes compensation payments for all kinds of game damage to the counties each year, including seal damage. The amount allotted to each coastal county depends upon reported seal damage, reported seal population and number of active fishermen. The compensation distributed to the counties in the model region from the Nature Protection Agency during 2002 and 2003 is described in the table below.

Compensation for seal damage in the model region during 2002 and 2003:
Counties: Södermanland and Östergötland

County in model region	2002 Compensation distributed in (SEK)	2003 Compensation to be distributed (SEK)	2003 Funds for co-financing seal safe gear (SEK)	2003 Compensation for seal damage on gear and catch (SEK)
Södermanland	780 000	940 000	420 000	520 000
Östergötland	450 000	465 000	95 000	370 000
Total/all counties in Sweden	18 900 000	17 430 000	4 800 000	12 630 000

Source: Own compilation based on Naturvårdsverket 2003: protokoll 26/03

As can be deducted from the table above there has been a slight reduction of total distributed compensation for seal damage in 2003. The counties that have been allotted less money for seal damage compensation in 2003 are mainly the ones north of the model region. The counties in the model region have received slightly more finances, Södermanland more than Östergötland, and Södermanland has a larger part of the financed allocated to co-funding of seal safe gear than Östergötland has.

The Environmental Protection Agency considers the compensation for game-induced damages (including the co-financing of game-safe gear to reduce future damages) as a vital part of the mitigation strategies. However an increasing number of game-induced damage of all kinds (bear, wolf, deer etc.) has led to some concern for future compensation schemes. The Environmental Protection Agency has not received more funding from the government in next year's budget; hence, the damage must be prioritized. Future compensation schemes might very well rely even more on co-funding of damage reducing gear, and other game damages might require some of the funds now compensating the seal damages.

Development of seal safe gear. The development of seal safe gear has been of great importance in the conflict between fishery and seal in Sweden. The fishermen in the northern parts of the Baltic were the ones to experience seal damage first as the seal population re-established itself after the decrease caused by toxic pollution in the seventies and eighties. The development of a stronger and more durable yarn (Dyneema yarn) was the initial step towards protection of gear.
Later on the development of a pontoon-trap (push-up trap) was based on the fishing methods and species traditionally used in the northern parts of the Baltic, mainly salmon. For this purpose the pontoon-trap has been very successful in reducing seal damage. The re-establishment of seal populations in the southern parts of the Baltic, here including the FRAP

model region, has brought some new problems with the development of seal safe gear. The traditional methods and target species vary from north to south, and in the model region and south of this, eel and other high value fish (aborre, pike, and pike-perch) are traditionally caught. Some of the fishing methods used are well suited for Dyneema yarn, but this does seldom solve the problem entirely.
The pontoon-trap was developed for trapping salmon and the preconditions vary when this is to be adapted to other methods and species.

The compensation schemes grant funding for development of seal safe gear for instance for putting Dyneema yarn in gear, or for the purchase of a pontoon-trap. The trap costs approximately 100 000 SEK, and 80% of this is co-financed by the compensation funds when purchasing the first trap. When the fisherman decides to buy more traps the co-funding is reduced to 60%.

Protective hunting. The grey seal has been a protected species at the West coast of Sweden since 1967. The general hunting season for grey seal was abolished 1975 at the East coast, but the possibility for local fishermen to hunting seal to protect gear was not abolished until 1988. The grey seal has been fully protected since then with the following derogations.

In 1997 the Swedish Environmental Protection agency granted permission to the project "Seals and Fishery" *("Sälar&Fiske"*[13]*)* to carry out hunting of 30 seals for scientific purposes. The Environmental Protection Agency issued 3 permits to hunt a total of 5 seals that were causing great damage in fish farms during the year 2000. These permits were issued in accordance with the Hunting and Game Management Act ("Jaktförordningen" 1987:905, §27) as well as with the decision from HELCOM (March 1996) to grant permission for restricted seal hunting.

The possibility to carry out protective hunting is restricted by the management plan and during 2001 and 2002 the Environmental Protection Agency decided that protective game management should not be carried out south of latitude 59 degrees north and sets a limit of 180 seals in total. For the counties Södermanland and Östergötland in the model region this meant that protective game management of seal could not be carried out. However the county administration for fishery and hunting could issue special personal permits for fishermen that had been troubled especially by seal damage. Several permits were issued in each county during this time, but not many seals were in fact killed.

In 2003 the regulation for protective game management of seal was changed that protective hunting could now be carried out in the model region as well, but not south of this.
Södermanland was allotted a quota of 10 seals, and Östergötland 15.
Until now only 4 seals have been shot in Södermanland and 1 in Östergötland.
The low number of seals shot can be explained by the special difficulties that exist when hunting for seal. The regulations stipulate that seal must be hunted from land (with a class 1 weapon) adjacent to the fishing gear. The seal must then be landed. Some of the difficulties are: the time consuming aspect in waiting for seals by the trap; the difficulties in getting ashore from the boat to get a safe shot when the seal is close to the gear; danger of ricochet of bullets on water close to summer cottages etc.; difficulties with landing the seal; and finally relearning old knowledge about seal hunting.

[13] The project was instigated by the Environmental Protection Board and was carried out in co-operation with the Swedish Board of Fisheries, WWF Sweden, the National Swedish Fishery Organisation, and Swedish Society for Nature Conservation and researchers from the Swedish Museum of Natural History.

Seal quota allotted to counties at the Swedish East coast during hunting season 2003 and actual number of seals shot in these counties during 2003

County	Number of seals Allotted	Number of seals shot until 3/12 2003
Norrbottens län	36	34
Västerbottens län	18	8
Västernorrlands län	14	2
Gävleborgs län	34	25
Uppsala län	20	2
Stockholms län	23	0
Södermanlands län	10	4
Östergötlands län	15	1
Total	**170**	**76**

Source: Naturvårdsverket, Skyddsjakt efter gråsäl år 2003, 2003-04-03
Coastguard information, 3/12 2003, own compilation

Synopsis – Grey Seal Management

Management/ Mitigation measure	Objective	Activity	Responsible administration	Legal foundation	Cost (thousand/SEK)
Protection of grey seal	Protection of wildlife and endangered Species		**Planning and monitoring:** NVV* **Management:** *(Guidelines and regulations:)* NVV *(Implementation and management:)* Regional administrations Municipalities	**International programmes and conventions:** - Agenda 21 - Convention on biodiversity - Ramsar Convention - Bonn Convention - Helsinki Convention **National programmes, laws, ordinances and regulations:** - National environm. quality objects - National strategy for sustainable developm. - Environmental code (1998:808) - Swedish hunting Law (1987:259) - Ordinance for Hunting (1987:905) - Ordinance: Species Protection (1998:179) - Ordinance: Damage through Wild Animals (2001:724)	

Grey seal management plan	Monitor and manage grey seal population	**Monitor population:** Inventory Photo-id Pup-count Population size Growth rate Pathology **Management:** Fishery-technique & statistics Seal protection areas HELCOM Hunting Information **Total**	*Planning:* NBF & NVV *Management:* NRM NBF & NVV NVV & regional adm. NBF & NVV NBF & NVV NBF & NVV	HELCOM recommendations Habitat Directive 92/43/EEG ”Artskyddsförordning” SFS 1998:1305	**Period: 2001-2005** 1 200 2 200 800 500 800 3 000 17 500 200 500 250 1 050 **28 000**
Economic compensation for seal damage	Reduce conflict fishery/seal	Compensation for damaged gear and catch, development of protective measures	**Planning:** NVV **Management:** Regional administration	”Viltskadeförordning” SFS 2001:724, § 11, § 12 ”Naturvårdsverkets föreskrifter” NFS 2002:13	**18 400**
Protective seal hunting	Reduce seal population to minimise conflict fishery/seal	Restricted protective hunting of seal	**Planning:** NVV **Management:** Regional administration	“Jaktförordningen” 1987:905 (revised version 2001:451) §24 and §23a	

* NBF: Fiskeriverket (National Board of Fisheries)
NVV: Naturvårdsverket (Swedish Environmental Protection Agency)
NRM: Naturhistoriska Riksmuseet (Swedish Museum of Natural History)

Sources: own compilation

7.2 Description of the Storylines found in the Swedish Discourse Analysis

Box 1: Concepts used in the discourse analysis

The discourse analysis starts from the basic unit of *themes* as identified in the interviews with stakeholders and codified in nodes (see technical description of the codification scheme in the interview programme QSR N6). Several of these themes are combined by the stakeholders to a larger unit, the stakeholder´s narrative or *story*. Within this story a specific “logic of argumentation” or mode of combining themes by arguments can be found – the *storyline*, which indicates the position of the stakeholder in the conflict. In an extreme case theme and story fall together in a one-theme-story with a storyline which melts down to one argument – but this is an exceptional case. In the Swedish seal conflict the discourse analysis shows that themes are clustered into stories by the stakeholders and

from every multi-theme-story a storyline can be identified through analysis. What is specific in the Swedish case is, that in the present conflict situation only two complete stories and storylines can be found that cover thematically all or the main aspects of the conflict (these are the official story in the grey seal management plan and the fishermen´s story). All other stakeholders have only "partial" or fragmentary stories. Their stories do not fully develop into clusters of themes that cover the main issues of the conflict – its reasons and causes, its context, its development, its methods and measures of mitigation and their assessment, its final solution, the valuation of interests and positions of other stakeholders (to mention the important components of a conflict that can be formulated in themes). That is, some stakeholders have the possibility not to engage fully in the conflict, only temporarily or with part of their interests and they can take the positions of an observer.

The basic concepts applied in this discourse analysis can be explicated as follows:

1. Theme: A theme is a semantic unit of analysis with the following components:
- *facts* (empirical information about processes or events related to the conflict, derived from a positive knowledge base such as official information, statistics, research, practical knowledge or experience),
- *interests* (the professional, economic, political etc. interests of a stakeholder that allow him to define his position in the conflict) and
- *values* (general normative statements that are anchored in cultural systems or generalised worldviews) that are tied together in a message or statement.

Themes can be formulated
- as open themes ("compensation payments for damage to gear or catch are a component of the Swedish mitigation method") or
- in the form of a valuing statements as it is usually done by stakeholders ("compensation payments for damage to gear and catch are an important and efficient form of mitigation because they help the fishermen to continue their otherwise economically threatened profession": here the theme, the valuing statement, and the backing argument are combined in the form as themes are used in discourses, for the purpose to defend own interests and positions or to oppose other interests, positions, arguments). *Arguments* can be one or several causal explanations, but must not be so; they can also be interpretations of reasons given by other stakeholders, analogies, or derived from convictions and beliefs). In the example above the theme is also formulated in an ideal grammatical form, as a sentence – usually a theme is not presented in this form by a stakeholder, but in many sentences, with much less clear and articulated arguments, in incomplete form, with the consequence that the theme has to be reconstructed and interpreted from the answers given.

Themes can be broken down in sub-themes, if necessary (see differentiation of nodes in the storylines presented below). However, the basic category of analysis is that of a "theme". Themes can be of different scope and complexity, but in this discourse analysis they have been broken down to the smallest unit with the components mentioned above. As the discourse of the stakeholders is about a specific conflict, themes can also be identified as formulating a main component of the conflict (this linking of the themes to the conflict may help to differentiate between important or core and less important or marginal themes in the conflict). In the Swedish seal conflict the themes and stories do not just codify the issues of the conflict as it is done by the stakeholders, but they overlap to a large degree with measures of conflict mitigation found within the present grey seal management plan. This overlapping has its basic explanation in the salience of measures in the present phase of the conflict: the measures discussed in the management plan are "thematic magnets" for all stakeholders, that is, intuitively or in a more reflected way stakeholders often formulate their themes in relation to the measures in the plan (a situation quite different from the one where no management plan or mitigation measures exist and stakeholders formulate themes freely in the controversies about the issue at stake).

2. Story: A story is the whole conflict at stake as translated into a web of arguments in the form presented by a specific stakeholder. The stakeholder as teller or author of a story is not a person (the person interviewed represents only the stakeholder that is usually a group or organisation). The teller or author-function is exercised by an indefinite number of persons who belong to the stakeholder as group. Although there are many differences and nuances in the individual arguments, the fishermen in the model region involved in the conflict tell one story which is a multi-theme story covering all

important components of the conflict. Furthermore their story differs from others – it is one in opposition to that found in the management plan (this contrasting of both stories helps sometimes to formulate more precisely the storylines in both stories). The story can be – in relation to the scope of the conflict – a rather complex unit of analysis in which facts, interests and values are intertwined in complicated ways and long chains of argumentation. To decompose the story in a way that indicates the direction of interests and arguments in the conflict (or the position of the stakeholder), the story cannot simply be dissolved into its elements or themes again, but another unit of analysis should make visible the direction of interests and positioning of stakeholders in the conflict: the storyline that can be constructed through the arguments that combine the themes.

3. Storyline: Beyond a textual description of the combining arguments that make a stakeholders storyline and finally mark his position in the conflict, storylines can sometimes be visualised in graphic form (as is also possible in the Swedish model conflict). A storyline is not necessarily a linear chain of arguments (this is the simplest case of argumentation; for instance, in the case of bureaucratic stories as in the Swedish grey seal management plan: a diagnosis of the problems is transformed into a description of objectives and from the objectives are derived measures to solve the problem or conflict, all components thought with a linear causality or imputed causality along the line "problem - objective - measure – solution"). There can be more complex structures of arguments which can graphically be modelled as ramifications of tree-graphs, circular structures or networks of mutually reinforcing arguments.
A storyline should at the end of the analysis make visible the position of the stakeholder in the conflict. There is also another way of identifying the positions of the stakeholders, however, the storyline helps to describe more exactly their position. The alternative way is a simple positioning along cleavage lines identified in the conflict. The seal conflict dates back to a basic cleavage (protection of nature/species vs. protection/use of resources for humans) and therefore stakeholder positions can also be marked in relation to that cleavage, that is, whether a stakeholder can be positioned on the nature protection or the resource use side of the conflict. However, this is not always simple and clear. Whereas fishermen and nature protection associations may be positioned in this clear form with confronting interests, for other stakeholder the positioning may be not simply "pro or contra", but characterised by a mitigating or mediating position (as for example with the Swedish grey seal management plan, or often with researchers as stakeholders), with partial positions, or with positions that vary from the basic cleavage as a result of a different interpretation and view of the conflict. There may also be contradicting positions of stakeholders (of which these may be aware or not).

Sources: own definitions, based on discussion in FRAP

7.2.1 The Official Swedish Storyline: The National Grey Seal Management Plan

The management plan as a stakeholder. In this discourse analysis the National Grey Seal Management Plan is interpreted as the official Swedish storyline considering grey seal. The document is seen as part of the discourse - not only as a joint reference for all stakeholders with their differing interests, but as a stakeholder of its own, a "stakeholder on paper" that articulates the interests of an invisible stakeholder which can in a preliminary way be described as the public at large (in Swedish society with its general interests and obligations that are articulated by government and parliament as political actor). The management plan has been formulated mainly by one agency, the Environmental Protection Agency, but it is not the storyline of this agency that is found in the plan. The plan can be seen as a stakeholder who "argues" with the other stakeholders about the pragmatics of conflict mitigation that Swedish society is able to realise by way of its government in the context of international and national political agreements and legislation.

To treat the management plan as a stakeholder of advocacy-type representing societal interests and articulating a special line of arguments is done here despite the fact that there are some qualitative differences between the storyline presented in an official and scientific document as the management plan and the storylines found embedded in the interviews analysed in the discourse analysis. The management plan is an official policy document – hence it is written and structured according to the legislative structures needed for such a document. It is the result of a policy-making process, where different stakeholders and experts have been heard and where compromises about mitigation measures have been found: the interpretation by the Swedish Environmental Protection Agency (which, in this role of formulating the plan can be understood more as an advocate or mediator, not as a stakeholder only) of the mix of facts, interests and governmental policies that have been presented.

The fact that the management plan is produced quite differently than the interviews with stakeholder groups should be kept in mind. However this does not change the fact that the storyline (interwoven of facts, values and interests) produced by the Environmental Protection Agency is of great importance to the discourse. The management plan is the focal point for discussion: since the management plan represents the official Swedish policy considering grey seal, it is the one factor that all stakeholders relate to in discussing the conflict and formulating their own interests. On account of this, we have decided to present an analysis of the inner logic at hand in the management plan as one of the main storyline. This shall help to understand better the oppositional storyline presented by the coastal fishermen as well as other stakeholders relating to the conflict.

The storyline in the management plan. The management plan reflects an overlapping set of interests,

- the "general interest" of the public at large (represented by the government) for nature protection and for a solution of the seal conflict,
- the scientific interests related to the generation of knowledge required to manage the seal population and the conflict, and
- the governmental and administrative interests of finding compromises between the conflicting parties.

Starting from this definition of the management plan, it seems possible to construct the stakeholder that articulates its interests through the plan as "national society as political actor". How does this stakeholder articulate its interests and unfold a specific line of argumentation of authoritative kind to which all other stakeholders refer in their definition of interests?
The management plan has an overall aim – "to formulate directives for the management of the Swedish part of the grey seal population in the Baltic sea in the five years ahead" – and a specific structure which is that of a traditional policy document that shows the way of its elaboration. The main parts of the plan are the following themes: development of grey seal population, biology and ecology, human impacts, legislation, seal damage, prior action, expected development, aims, knowledge required, measures, resources required and responsibility. There is a managerial rationality unfolded in the document which can be simplified as analysis of the problem or situation and derivation of measures from this analysis. Seen from this logic and from the construction of a "societal actor representing the common interest", the core of the plan can be found in the subsequent parts "aims, knowledge required, and measures" as these define the scope and form of action. However, for the discourse analysis it is also necessary to find the core arguments on which the plan builds its measures, that is, to describe the problems which should be solved with the plan. This

diagnosis is concentrated in the section "expected development" which delivers the main arguments from which the plan is derived.

The core arguments in the management plan (in the diagnosis of the present situation).
The justification of the management plan is not given in terms of conflict mitigation but through a diagnosis of the problems found with regard to the grey seal population and coastal fishery.

(1) The seal stock is recovering since the 1980s and should be able to recover further from about 10 000 animals now to at least 13.000 in 2005, which requires that the present trend of recovering continues and no worsening of the environmental or health situation or other complications occur.

(2) Coastal fishery is impacted most by seal damages (about 10-20% of the value of catch when indirect damage is also included); the damages have increased much faster than the growing of seal stock (30% increase of damage per year, 6, 5% increase of seal stock per year) which is seen as indicator of changing seal behaviour.

(3) Illegal hunting has been found before the management plan and should be replaced by controlled protective hunting to prevent unwanted consequences of hunting, not only as threat to the control of seal stock, but also to counter the inclination to see the seal as damaging animal only which needs to be hunted.

(4) By-catch of seal in the gear of fishermen should be reduced (there is already a general aim formulated in the national environmental objectives of Sweden: to reduce by-catch of all marine mammals to maximum 1% of their population in 2010).

These main arguments are also reformulated in the objectives of the plan, therefore it can be concluded that they make the core of the argumentation from which the measures of the plan are derived. The knowledge on which this argumentation is built is predominantly scientific knowledge delivered by the national museum for natural history (with regard to information about the seal population) and the national "seal and fishery project" (with regard to research and development concerning fishing gear) and filtered by the plan formulating institution (for the purpose to bring the diagnosis in line with the measures formulated), and managerial or political knowledge, as codified in legal and other policy programmes – nowhere is local or practical knowledge of stakeholders mentioned to underpin the measures formulated. The plan follows a traditional "top down"-perspective of policy implementation.

The storyline in the management plan (as built from interest-bound arguments).

(1) The seal is not seen as a natural resource for human consumption but as a natural component of the Baltic ecosystem and therefore it needs to be protected to maintain vital seal population in the long run (not because of specific interests of certain parts or groups of the human population).
(2) Instead of fish it is fishery that is part of the dominant argumentation line in the plan – fishery defined as small scale coastal fishery and as impacted negatively by damages from seals. This (selective) diagnosis of coastal fishery as economically impacted negatively by seals allows for the justification of compensatory measures and for measures to develop and implement improved gear, but does not allow for further measures to protect the economically threatened profession of coastal fishermen.
(3) The salient argument of "reducing illegal hunting" is constructed to justify controlled and legalised protective hunting (hunting of seals is not allowed after HELCOM

regulations, therefore, every form of hunting, also as exceptional, for experimental or scientific purposes, is in danger of being seen as illegal by other nations).

(4) Complementary to the argument for protective hunting to manage the seal population is the argument of reduction of by-catch through improved or seal-safe gear etc.

(5) From the arguments 1-4 specific measures for grey seal and conflict management are derived with compensation payments, support for seal safe gear and protective hunting as the core.

Arguments 1-3 are the main arguments from which the management plan unfolds its measures as summarised in 5 (argument 4 is complementary). Arguments 1 and 2 represent the problem diagnosis part of the storyline, argument 3 and 4 relate to the objectives of the plan that relate to the problems, and argument five is the proposal of measures that are available to achieve the objectives and/or mitigate the conflict. Missing in the plan is the analysis of fish as component of the marine ecosystem. In difference to the "bio-centric account" of seals nearly nothing is said in the diagnosis about the fish in coastal waters as part of the marine ecosystem. Fish are seen as resource for fishermen and the diagnosis regarding fish and fishery (which is not included in the core components of the plan, only in the preceding analysis) is that of the economic development of coastal fishery and the development of catch. It can be asked, however, why fish is not mentioned in the core of the diagnosis and aims formulated in the plan.

The logic of argumentation in the management plan. With the three dominant arguments a storyline can be constructed which is coherent for the purposes of

- maintaining and protecting the seal population,
- compliance with international and national legislation,
- compromising the interest of nature protection with that of resource use of fishermen,
- defining the scope of solutions possible within the established system of national environmental policy and common fishery policy (without questioning these policies more than found in the policies themselves: the fact that Common Fishery Policy is crisis shaken in the years of the plan may catalyse another view of coastal fishery and coastal fishermen that has not yet entered the plan).

For the interpretation of the storyline we try to identify (a) the basic argument from which it starts and (b) how the arguments are connected.

(a) The starting point of the management plan is the diagnosis of the grey seal population quantitatively (size and development of seal stock) and qualitatively (status of the seal as natural part of the Baltic ecosystem). This does not seem surprising as this is a management plan for seals, however, it should be noticed what is not mentioned in this diagnosis: there is no discussion about the methods and the exactness of seal population monitoring and there is no analysis of the external context from which the seal conflict could be assessed in relation to other conflicts or fish eating animals. Although there is a detailed summary of the knowledge about the biology, ecology and history of seals, there is no cross-reference to other problems and conflicts along the coast – this means, there is also no comparison and assessment of the seal problem and the seal damages in relation to other damages for coastal fishery.

(b) As a scientifically backed policy document, the management plan includes only facts, normative knowledge (legal rules etc.), reasons and assessments that are directly related to the conflict and which allow to formulate the core of the conflict so that it becomes manageable

in a bureaucratic set of action, through specified measures. The core of the conflict is reconstructed with three components: development of the seal population – development of coastal fishery – acceptance of seal hunting. From these components the solution is derived in a combination of measures. The dominant arguments in the plan are the ones in favour of seal protection and seal population maintenance, although practically seen the measures directed to coastal fishermen take most of the budget of the plan. Among these measures are corrective ones (compensation payments) and preventive ones (gear improvement and behaviour research). Neither the core arguments nor the measures derived are presented in a clear causal chain of arguments, but more in the managerial logic of a normative framework with diagnosis of the situation, formulation of management objectives, derivation of measures to achieve solutions. The striking moment in the presentation of knowledge and arguments in the plan – again following the purpose of a policy document – is, that no controversies, no contradicting facts, no clashing knowledge forms are presented: the plan is formulated under the premise that this is up to date, coherent and scientifically validated knowledge, the best knowledge available, and uncertainty is acknowledged only to the degree of lack of empirical knowledge or the usual scientific uncertainty.

What is lacking in the storyline of the management plan are mainly components of the external context of the conflict to which fishermen often refer:

- a diagnosis of the interests that constitute nature and species protection (this argument is reduced to the one: seals as natural component of the ecosystem which therefore must be protected) and in this context also a lacking diagnosis of touristic and recreational interests,
- a diagnosis of the changing economy of coastal regions (where fishery, other primary production and industrial production are less and less important, whereas only one sector grows: tourism and recreational service economy),
- a diagnosis of the changing role of professional fishery and future forms of coastal fishery,
- a diagnosis of different forms of knowledge that may be required for the solution of the conflict.

The document claims to reflect the participation of the relevant stakeholders in its production by way of the traditional Swedish hearing procedures in the policy process. The influence of the stakeholders on the final plan or their positions in regard to the single measures or the diagnosis of the situation is, however, not made visible in the plan itself. It can be assumed that the plan is an expert-dominated document in which the stakeholders less or indirectly affected by the conflict, or stakeholders with general interests (such as nature conservation) only, have not actively articulated their interests. The general interests of society as "ideal interests" in nature conservation and species management can be seen as in favour of one side in the conflict and therefore have to be compromised or balanced with the interests of the fishery side: this is the – not explicitly formulated – purpose of the management plan.

7.2.2 An Oppositional Storyline: The Costal Fishermen's Perspective

During this discourse analysis a total of 27 key persons in all relevant stakeholder groups were interviewed. The interviews were taped and transcribed, and then processed using QSR N6 software. The text units of the interviews were categorized to create an overview of the important themes in the discourse as well as of the clustering of arguments and stakeholders.

The themes created during the process will be used as a base of analysis, both in the presentation of the storylines that follows (which is an abbreviated form: a detailed presentation of the fishermen´s story with detailed quotations can be found in the appendix of this report) as well as in the later graphical presentation of opinions, storylines etc. in sections 7.3, 7.4 and 7.5.

As a group, the coastal fishermen are the only stakeholders that have a complete and coherent story built of interrelated assumptions of facts, interests and values. Their storyline is created in opposition to the storyline presented in the National Grey Seal Management Plan. Thematically seen the fishermen´s story is not a story with one dominant topic but with a clustering of topics in a specific way which reveals their points of view, interests and valuations as such in opposition to the dominant, "officially" created view of the conflict that is expressed in the management plan. The fishermen´s story has less a thematic order of its own but follows the knowledge and measures presented in the management plan. To some degree this practice of following the themes in the plan is supported by the questions in the interviews, however, the dominant reason for it is given by the arguments and measures in the management plan that evoke critical reflections and reactions from the fishermen. Although their story is not presented or produced in a written or structured way, as the management plan is, the argumentation and the logic of combination of facts, interests and values unfold in a coherent line of thought amongst the fishermen in defence of their resource use activity.

The storyline presented here relates primarily to what can be seen as 'internal conflict factors'; that is factors that are described to be directly connected to the conflict between grey seal and fishery. During the interviews even 'external conflict factors' were addressed by the fishermen. These conflict factors are not directly related to the management plan, but should be seen as background factors in which the conflict is set.

The main areas that are contested in factual terms are:

- The size of the grey seal population and its reproductive rate.
- The effects that can be expected of the protective seal hunting.

These contested areas are very often used by the fishermen as a starting point for their argumentation. In the following sections the fishermen's perspective on the facts and the way they are used in the storyline is highlighted.

Differences within the stakeholder group. Fishermen from 3 different regions were interviewed. The Swedish model region in FRAP consists of the two counties Södermanland and Östergötland. 6 fishermen from these counties were interviewed, were only a total of some 50 fishermen are still carrying out coastal fishery. The average age is 50+ and the fishing methods concentrate on traditional species found in the archipelago such as pike, perch, sander and eel.

In 2003 protective hunting for a total of 25 seals was allowed for the first time in the model region (before this seal hunting had only been allowed according to individual hunting licences when damages were considered to be very serious). Still counties south of the model region have not been given the opportunity to carry out protective hunting from a general quota.
To investigate the impact of protective hunting as a measure, interviews were even carried out with the very same stakeholder groups in Kalmar county south of the model region were

protective hunting is yet not allowed. Here a group of 4 fishermen were interviewed. The coastal fishery in Kalmar county is more widespread and almost 200 coastal fishermen are active in the county (the coastal line is long and includes the large island Öland as well). The fishery concentrates on some of the same species found in the archipelago as in the model region. However more fisheries in the county is carried out in the outer parts of the archipelago, and more fishermen rely almost entirely on eel fishery.

The fishermen from Kalmar agree with the fishermen from the model region in almost every way, hence the total storyline is the same for the two groups. The one major difference relates to protective hunting: since protective hunting is not yet allowed in Kalmar, the fishermen are much more preoccupied with this measure. They argue that an extensive protective hunting is needed in Kalmar County as well, and that it is unjust not to allow hunting in the southern parts of the Baltic as well (Kalmar, Blekinge and Skåne County). The facts, interests and values drawn upon and the way they are used concerning protective hunting are the same as for the fishermen in the model region. The difference seems to be that the fishermen in Kalmar are focussing very much on this one measure that is withheld from them; and as a consequence of this the level of frustration seems much higher. The same lines of argumentation and perspectives on the seal/fishery conflict that are found in the model region are aggravated and stressed by the fishermen in Kalmar. This can be connected to one of the main effects of the protective hunting (stressed from all sides in the conflict, including the fishermen in the model region): that the protective hunting allows fishermen to feel somewhat in control of the situation thereby relieving some of the frustration.

The management plan. Since there is a management plan for grey seal, the discourse amongst the fishermen is often focussed on the measures in the plan and does not unfold a thematic order of its own. The question whether there would be an original or own story of fishermen, independent of the management plan, seems rather hypothetical in the situation given: the reality-taken-for-granted from which the fishermen start to argue is the management plan, and their interests can be clearly formulated in relation to this plan which is for them characterised through a complete lack of fishermen´s knowledge. The fishermen are not opposing the idea of a management plan for grey seal as such, neither are they opposing all the measures applied in the plan. What they contest is the validity of certain information provided by some of the other stakeholders and the effectiveness of some of the mitigation measures developed. This is the overarching logic of argumentation that unfolds throughout the ramified storyline of the fishermen.

Compensation payments. In node *7.1Measures/compensation, damage* and *7.1.1 Measures/compensation/invisible losses, expected catch* the fishermen's perspective on compensation payments is reflected. The fishermen all stress the importance of the compensation payments for damage on catch and gear. According to them, the possibilities to carry on with coastal fishery despite the seal damages are depending on the compensation payments. Some fishermen are concerned that the compensation for damage on gear and catch will not be a part of the management plan in the future.

Generally, the fishermen get approximately 50% of the compensation they apply for, and the majority of them is quite content with this level of compensation (however some fishermen argue that the compensation should cover all the losses). Though some of the fishermen think that the application forms are too complicated, they are also content with the procedure of distribution of compensation that has been carried out by the regional administrations. The new model for distributing the compensation payments between fishermen that is being

developed by the Board of Fisheries is met with a certain amount of scepticism: the fishermen fear that the model will result in lower compensation payments.

The main complaint concerning the compensation payments is that the 'invisible' losses are not compensated. The compensation is first and foremost given to balance the costs for damage on gear (to repair nets etc.) and secondly for the damages caused on catch. Sometimes damaged fish are left in the nets or a trap, yet again other parts of the catch is escaping when seals damage the nets or traps. This direct loss can be calculated based on fishery statistics from other days or years when the seal hasn't damaged the gear. The 'invisible' loss of catch is the fish that is either scared away from the gear by the seal, or the fish that is eaten from the nets leaving no trace behind. The fishermen estimate that this kind of loss is significant; and they would like to be compensated for these losses as well in the future.

With regard to the theme "compensation payments for damage through seals" the fishermen´s core argument is rather simple. They are experts for assessing the damages, and their reflections concerning this theme and mitigation measure converge to the message "the measure is necessary and implemented quite well, however it could be improved with regard to certain forms and components of damage".

Seal safe gear. The possibility to apply for financial aid for seal safe gear is much appreciated among the fishermen (both components of the measure, financial support and the technologies of seal safe gear, are seen as contributing to the mitigation of the conflict). The fishermen argue more with regard to the methods technical efficiency (or lack of it), less with regard to financial support. Only one group of fishermen, those using eel traps and nets are not as positive as the ones able to use Dyneema yarn (a strong yarn that is hard for the seal to rip apart) or the pontoon trap (a seal safe trap that is elevated by the use of air). The main reason for their discontent is that they do not think that these methods are suitable for their types of fishery. Fishermen in this group are even prone to be more sceptical towards the use of resources on developing seal safe gear; often they are more attracted to more offensive measures, such as extensive seal hunting.

The Dyneema yarn has been accepted as an effective and natural part of the fishery. The fishermen agree that the yarn has had positive effects in minimizing seal damage, and some even claim that the seal has learned to avoid the gear with Dyneema yarn. There is some concern, though, that the seal is now trying to gain access to the fish further out in the traps (the Dyneema yarn is normally only applied in the inner parts of the trap). If this is a general trend, the fishermen might have to use the Dyneema yarn on all parts of the gear, which could turn out to be quite expensive.

Several of the fishermen have invested in pontoon traps (often even referred to as 'push-up traps') that have proved to be efficient in the northern parts of the Baltic, especially for fishing salmon. The efficiency of the trap seems to be very much depending on where it is placed. Some of the fishermen have had very good catches, whereas others are disappointed by the minimal catches.

The disadvantages with the trap are that it is not suited for all kinds of fishery (for instance is the eel fishery not considered to be suited for the trap); that the success of the trap is depending on the position (it should be protected from hard winds and should preferably be placed where the fish normally follow the reefs); that it is not easy to move; and that the trap is easily overgrown in the nutrient rich waters of the southern parts of the Baltic.

The advantages with the trap are that it is improving the working environment of the fishermen (the trap is lifted without any manual labour and the catch can easily be emptied into the boat); that the size of the meshes only keeps the desired sizes in the trap (which saves time and work removing unwanted sizes; and that neither the seal nor the cormorant are able to damage the catch (even the cormorant damages fish in the model region).

The trouble gaining access to water suited for the pontoon trap is part of a general problem gaining access to coastal waters for fishery (see external conflict factors below). The difficulty is further reinforced by the reactions to the pontoon trap from neighbours and non-professional fishermen in the local community. By the look of it, the trap seems quite big, and the neighbours fear that the trap will devour all the fish in the area.

Not all fishermen see seal-safe gear as a promising method (differences depending on target species fished and effectiveness of gear for certain fish species). However, there is a main figure of argumentation emerging from their reflections about seal safe gear: to be accepted by fishermen seal safe gear should be technically efficient in preventing damage, but moreover a method which is contributing to the improvement and development of coastal fishery – then they are interested in testing, modifying or improving the gear (especially the push up trap which is seen as a way of diversifying the fishery, thus enabling the coastal fishermen to stay in business despite of the seal damages).

The disagreement on the size of the grey seal population and knowledge production.

The dispute over the size of the grey seal population is often brought up in the interviews. In node *2.4 Return, seal/size of seal population* the contesting perceptions of the grey seal population are brought together.

Generally, the coastal fishermen argue that the grey seal population is much larger than expressed officially (in The Grey Seal Management Plan etc.). Some refer to own observations of seal, others argue that the reproduction rate is higher than officially claimed. Since the Swedish Museum of Natural History has the responsibility to monitor and evaluate the grey seal population, their knowledge has great consequences. The national authorities rely on the scientific information produced when they plan and implement seal related measures. The dispute arises when the local knowledge and perceptions of the fishermen differ from the scientific knowledge produced by the central institution.

The fishermen question the methods used by the Museum of Natural History, saying that the methods underestimate the actual grey seal population. The fishermen believe that this is a consequence of inadequate counting methods, but even more so: that the Museum of Natural History is indeed a stakeholder with a hidden agenda. It is repeatedly expressed by the fishermen that the museum is in favour of a large grey seal population and that this is characterizing the results and the methods. This perception is reflected in node *6.1.11 Stakeholders in conflict/Talk about/scientists, Riksmuseet, säl & fisk.* Several of the fishermen and representatives of the fishery units describe the museum as the main stakeholder on the seal side of the conflict (also that they set out seals) and thereby also as the main obstacle to a future solution of the conflict.

The disagreements on the size of the seal population result in several interconnected conclusions. The fishermen feel that the scientific knowledge used as a basis for the management plan is inadequate at best, manipulated at worst. The fact that the Swedish

Museum of Natural History is perceived as a stakeholder makes the monopoly in knowledge production seem unfair to the fishermen. They feel that their local knowledge is not taken seriously and that the national institutions are manipulated by a stakeholder on the seal side of the conflict.

Connection between estimated seal population and protective hunting. The disagreement on the size of the seal population affects the perception of measures described in the management plan. The disagreement is referred to in node *7.3 Measures/protective seal hunting* on several sub categories. The estimated seal population is particularly important in determining the quota that can be hunted. Node *7.3.2 Measures/protective hunting/quota* bears witness of this: the fishermen perceive the quota to be too restrictive and think that the seal could be hunted more extensively (or even as common prey) if the real numbers where acknowledged by the national authorities.

The fishermen perceive the restrictions and regulations on protective hunting as too strict; this is expressed in nodes *7.3.1 Measures/protective seal hunting/weapon, 7.3.4 Measures/protective seal hunting/restrictions from boat* and *7.3.5. Measures/protective seal hunting/gathering.*
The current rules on protective hunting stress that all killed seals should be landed. This implies that hunting should only be carried out in places and with methods that ensure that the seal can be landed. The seals must be hunted with shooting weapons (more specifically: class one weapons that use a heavy bullet with high impact), no traps are permitted. The hunting should be carried out from a firm position: land, ice or boat attached to land or ice. No hunting is permitted from boats floating freely. From the fishermen's point of view, these rules are making the hunting very difficult. In the past, fishermen say, the seal has been hunted with shotguns from the boat whenever they were spotted[14]. The possibility to use shotgun instead of class one weapon is of great importance to the fishermen. There is a risk that heavy bullets will ricochet on the water surface when using class one weapons, and this makes the hunting risky when carried out in the inner archipelago near houses and boat life.[15]

The fishermen find the rule to only hunt from land particularly wrong and inhibiting since the seals are most often spotted from the boat when attending to the fishing gear. Even if it is possible to disembark in the inner parts of the archipelago it is very likely that the opportunity to hunt the seal is surpassed when the fisherman is in position on land. In the outer parts of the archipelago it is not always possible to get a shot from land since the fishing gear could be well out of sight several kilometres away from land.

The fact that the seal must be landed according to the rules makes the seal hunting even more difficult according to the fishermen. Very often the seal sinks as soon as it has been hit, and if the waters are deep landing could be very problematic. Several fishermen say that a diver is needed to land the seal – and if the fisherman is not a diver himself this could be expensive and time consuming.

[14] Seal was even hunted with clubs when lying on the cliffs, as referred to in node *7.3.7 Measures/protective seal hunting/former hunting*.
[15] According to the Environmental Protection Agency, the rule of using only class one weapon is applied to ensure that no seals are only wounded during the hunting. The Environmental Protection Agency believes that the use of shotguns would increase the risk of wounding seals, just as the right to hunt from boats would. On the other hand, the fishermen refer to former hunting methods and say that the use of shotguns is sufficient to kill the seal as it has a very weak scull structure, and that the risk of only wounding the seal would be no higher by doing so, especially if the hunting could be carried out from the boat at a very short distance from the seal.

The disagreement even taps into the discussion on seal protection areas, especially node *7.4 Measures/seal protection areas/no longer needed*. Here the fishermen claim that the actual, much higher, number of seals makes the seal protection areas unnecessary. Not only is the seal sufficiently reproducing without these protective areas, but since the seal protection areas are off-limits for seal hunting it makes effective hunting difficult.[16]

In the connection of the themes "development of the grey seal population" and "effective hunting" the fishermen describe in detail the main dilemma in which they have fallen through the management plan. They appreciate for different reasons the possibility to shoot seals, however, the technology and method of hunting tolerated make hunting as a method to protect their gear and catch rather inefficient: the quota is too small, the hunting methods do not allow for quick and safe killing of seals (not many seals can be killed when the shooting has to be from land and the dead body has to be delivered to the authorities). Protective hunting has developed into an expert controversy between the fishermen and the Environmental Protection Agency about the quick and safe killing of seals. This controversy is extended with the following thematic nexus between effects of hunting in relation to behaviour change of seals.

The disagreement on the effects of protective seal hunting in connection to seal behaviour. In node *7.3.13 Measures/protective seal hunting/effects of seal-hunting* another factual disagreement is unveiled. This node collects the contesting views on the effects of protective seal hunting. Whereas the knowledge on the size of the grey seal population is monitored by the Swedish Museum of Natural History, the effects of the protective seal hunting are evaluated by the Environmental Protection Agency on the basis of reports from Project Seals & Fishery (Board of Fishery) and reports from regional administrations.

The evaluation is carried out each year and presented as part of the yearly plan for protective grey seal hunting. Still, the results seem unclear, there had not yet been clear indications off what effects the protective hunting has had so far. The Environmental Protection Agency, the National Board of Fishery and the regional administrations think that the protective hunting has not been carried out long enough to demonstrate any obvious effects. Since no clear results have been demonstrated by the national authorities, all stakeholders involved are left to speculate on the effects.

Generally, the fishermen believe that the seals will be scared out of the inner archipelago – and preferably entirely away from humans – as a result of effective protective seal hunting. The effect is often explained by referring to the connection between seal hunting and seal behaviour in the past.

The fishermen think that the seal has changed its behaviour since it regained its reproduction capacity and increased in numbers. It is considered to have lost its fear of humans, and some

[16] This is the one area in which the fishermen from Kalmar County differ somewhat from the fishermen in the model
region. Protective seal hunting is not yet allowed south of the model region and Kalmar County is situated just south of the Östergötland. The fishermen in Kalmar are upset that this difference exists – and they perceive it as being very unjust and as a threat to their income and livelihood. It should be noted that several of the fishermen in Kalmar had been given special permits to shoot seal during the last year. The total number of seals shot in this manner equals the general quota given to many of the northern counties. Hence, the frustration over the fact that Kalmar is excluded in the protective hunting carried out according to quotas set in the management plan is not entirely logical: the fishermen in Kalmar are given almost the same quota of seal dispersed on personal licences that are the fishermen in the regions were hunting is carried out according to a general quota.

individuals are even thought to have specialised in feeding from the fishermen's gear. This is another part of the disagreement on the effects of protective seal hunting: the question as to whether or not there are specialists amongst the seals that damage the gear, or whether it can be any seal in a group that will damage the gear. For the fishermen the opinion is clear; the seals creating the damage are specialists (only one of the fishermen did not agree with this).

This has consequences for the expected effects of the protective hunting: if there are specialists, then the shooting of such a specialist would stop the damage until a new specialist finds the gear. If there aren't any specialists other seals will continue to damage the gear.

The fishermen are aware of the psychological effects of seal hunting: they feel more in control of the situation when it is allowed for them to hunt seal that is damaging gear or catch. This point of view is expressed in node *7.3.15 Measures/protective seal hunting/psychological effects.*

The other psychological effect of the right to carry out protective seal hunting is reflected in the perception of the seal. As expressed in the quote above, the seal can be perceived more as a game resource than just as a pest when it can be hunted.

Though the psychological effects are recognized, they are mainly seen as a secondary effect of the protective seal hunting. The moral right to shoot seal that is damaging catch or gear is considered to be important. The right is compared to other shopkeeper's rights and possibilities to defend their property: if a thief is constantly breaking into the shop something must be done to protect the owner's property. The moral rights of the fishermen to hunt seal are reflected in node
7.3.14 Measures/protective hunting/justification, right to hunt.

With regard to protective hunting the completed set of argumentation by the fishermen connects in coherent ways their own observations (of seals), interests (with regard to their fishery) and values (in a moral rights-argument) with the help of arguments that fulfil the role of a theory about seal behaviour. This theory is derived from their observations and local knowledge, connected by basic assumptions (about the size of the seal population), hypotheses derived from assumptions and observations (about the behaviour change of seals), and conclusions (with regard to effective hunting). This theory is defended against opposing theories (created by the official seal monitoring agency).

The cleavage between rural and urban interests in nature conservation and resource use. Several of the fishermen think that there is a cleavage between the interests of rural and urban populations when it comes to understanding the conflict, its effects and the fishermen's right to defend their business. This is reflected in node *6.2 Stakeholders in conflict/rural community/urban community.*

When the fishermen portray the conflict as a conflict between rural and urban people and their perspectives, the nature conservation perspective is represented by the urban community. The urban perspective is seen as unrealistic and distanced from the local knowledge and the realities of production. The stakeholders associated with this urban perspective are the Environmental Protection Agency, the Museum of Natural History and the NGO organisations and activists (referred to in a very diffuse and imprecise manner by the fishermen). The politicians are considered to follow this urban perspective of fear of reactions from the urban elites and voters. From the fishermen's perspective this is even a reflection of

an unfair power division: the local producers and communities are ruled by urban people that do not understand the rural preconditions and difficulties.

In the comparison with other conflicts (in order to better understand their own conflict) the fishermen unfold a clear perspective – that their conflict is an example of the general conflict between wildlife protection and (small) rural producers. The conflict between seal and fishery is often compared by them to the conflicts between wolf and livestock keepers or the conflict between Sami reindeer herders and the lynx. Not only do the fishermen find similarities between the conflict types (conflicts between resource use and nature preservation) but also between themselves as small-scale rural producers and, for instance, the inland rural livestock herders. This is the only occasion where the seal conflict is placed clearly in a larger discourse of resource use and its control as related to rural and urban people.

Solutions to the conflict/ future perspectives. The fishermen are not very specific when talking about future solutions to the conflict. The possible solutions mentioned by them all relate to the measures in the management plan: getting higher quotas for seal hunting and improving hunting, getting compensation for invisible damages, and inventing new seal safe gear. This gives the impression that no new solutions in the long run have been envisaged. The fishermen living south of the model region (that have not yet been allowed to carry out protective hunting as in the model region) have a more negative perspective on the future solution of the conflict. This can be exemplified by one example from a fisherman who thinks that it is too late to solve the seal conflict:

Fisherman: "That's how I feel. I feel that way because the fishery in the outer archipelago is affected by the decrease in population in the entire archipelago area. When the archipelago was more densely populated everything was managed better. Back then everyone helped scaring off the seal and it was still wild. Today there's nothing like that. (…) We really need to take immediate action now that the damages are increasing. But we won't get very far because discussions are always delayed by the politicians – and at the same time we are suffering the consequences."

A perspective for the solution of the conflict in the long run is not unfolded in the arguments of the fishermen and they are not very interested in addressing this "speculative theme" which seems too far away from their immediate problems and interests, or which is based on the argument of resignation ("it is too late for solving the conflict").

External factors influencing the conflict. The external conflict factors presented here are themes and factors that came up during the interviews but are not directly connected to the conflict between seals and fishery, although still part of the context, for example, environmental changes, economic preconditions for the coastal fishermen and other conflicts. These factors should be seen as the scenery in which the seals-fishery conflict is set.

The fishermen agree that it has become increasingly difficult to make a living from coastal fishery during the last 20 years. The number of active coastal fishermen has been heavily reduced during this period, and the average age has increased. Furthermore, the fishermen point to the fact that no younger fishermen are interested in starting a business – the future is to uncertain and the incomes to low to attract a future generation of fishermen. The reasons mentioned for the economic decline in coastal fisheries are (a) environmental changes (node: 4. Environmental changes; the node includes eutrophication; industrial pollution; changes in fish species and abundance; as well as cormorant), (b) economic changes in the coastal

fisheries (node10. Economic change, coastal fishery), (c) other conflicts affecting coastal fishermen or the coastal areas.

(a) With regard to environmental changes the fishermen especially point to eutrophication and industrial pollution, when they want to explain the changes in fish species and stock. The eutrophication is considered to be especially damaging for the reproduction of traditional species found in the inner archipelago: eel, pike and perch. A vague optimism can be detected, since some effects of eutrophication are described as decreasing; for instance the bladder wrack is re-establishing itself in some of the fishing waters. Still alga flowering is common in the model region as in most of the Baltic. It should be noted that some positive effects of industrial production are mentioned by several fishermen. The turbines of paper mills are considered to have positive effects on the water quality, since the water is enriched with oxygen. Secondly, the former method of rafting timber from northern Sweden to the south is sadly missed: the fish stems were following the rafting (for the insects in the timber and the protection), and the fishermen found it to be successful to fish near the raftings.

The major changes in fish species and stock are seen to be: lack of herring (that was a major part of the income until the mid-eighties); lack of pike and perch (species traditionally found in the model region); lack of eel in some areas of the model region (especially in the northern parts of the region); and lack of cod. The changes in species and stock are considered to be effects of eutrophication and extensive fishery.

The cormorant is considered to be a major problem for the coastal fisheries, in some respects even more so than the seal. Whereas the seal is mainly seen as a problem due to the direct damages on gear and catch; the cormorant is perceived as a threat to the fish stocks in general. It is assumed that the large populations and colonies of cormorants are eating larger amounts of fish than the grey seal. The seal is considered to be a natural part of the marine environment, whereas the cormorant is perceived as an intruder. It should even be noted that the historical use of seal as a resource effects the perception of the value of the seal; the cormorant has not been used as a resource as has the seal.

The fact that the management plan for grey seals offers compensation for damage on gear and catch, as well as for developing seal safe gear and outlining rules for protective hunting seems to have some positive effects compared to the cormorant. There is no management plan for cormorant, and thereby no compensation offered for the losses perceived by the fishermen. So far, the only possible method to deal with cormorant related problems has been protective hunting managed by the regional administrations.

(b) Economic changes in the coastal fisheries: In the node fishermen point to the changes in prices, distribution and livelihood during the last 20 years. The change in species mentioned above has even had major impacts on the economy of the fishermen. Many were dependant of the large stocks of herring and cod to supplement the more traditional archipelago species such as pike, perch and eel. Now that the stocks of herring and cod are declining, it is increasingly difficult to make ends meet. The fishermen feel that the prices hasn't kept up with the general inflation and several of them think that the diminishing number of wholesalers are pressuring them since there is not competition amongst the wholesalers. Some fishermen even believe that the wholesalers agree amongst themselves to set the prices at a certain level to prevent competition:

Previously the fishermen had their own distribution and marketing centrals (often cooperatively owned), but these structures went bankrupt during the 80'ties due to competition from larger retailers and large scale fishery.

Infrastructure is a major concern for the fishermen. Since there are no longer as many fishermen along the coast, it has become increasingly difficult to arrange common transportation and finishing of the products. This means that the fishermen now have to bring their products to the nearest retailer, or alternatively arrange a pickup in a nearby location were several fishermen can sell their products. This has serious implications for the fishermen and their economy: not only is it time consuming and expensive to bring the products to the retailers themselves, but it even effects the quality of the products – the fish is transported to remote centrals and sold on from this point. One of the unique qualities of the small scale coastal fishery has been that the fish is very fresh and is only transported a small distance to the consumers. The existing infrastructure threatens this quality aspect.

The very limited possibilities to make a living from coastal fisheries has effected the recruitment of young fishermen; the middle age is very high and it is not likely that a new generation of fishermen will be interested in perpetuating the fishery. The fishermen express great concern about these negative prospects for the future. Many of the fishermen stem from families with fishing traditions and the lack of future fishermen would mean the end of a way of using local knowledge and cultural specialisation.

The large scale fishery carried out in the Baltic is seen as part of the problem. The fishermen tend to choose their words carefully when talking of the large scale fishery, and especially of the National Fishermen's Association. There is some discrepancy within the group of fishermen interviewed on this issue: fishermen fishing in the inner parts of the archipelago (often on a smaller scale than the ones fishing in the outer parts of the archipelago) are more critical towards the large scale fishery than are the others. The more critical fishermen are often associated with or active in the Coastal fishermen's Association.

(c) Other conflicts affecting coastal fishermen or the coastal areas: There are other conflicts within the fishery sector or in the coastal areas that are affecting the fishermen. This is reflected in node *11.Other conflicts.* Some of the aspects mentioned above in the section dealing with environmental changes can also be seen as conflicts or part of ongoing conflicts (the cormorant is an example of such a theme that can be seen both as part of an environmental change and as a conflict factor in itself. However, we have chosen this division of categories.) The conflicts can be categorized into two groups:

a. Conflicts relating to access to water. These conflicts are mainly affected by the new residential patterns in the archipelago areas. There has been a shift from permanent residents to part time and summer residents in the archipelago areas. The recreational residents are not inclined to leave room for productive activities such as fishery. The water rights are often associated with land ownership – thus making it harder for the fishermen to gain access to coastal fishery waters. Moreover have the property taxes risen quite dramatically in areas that attract recreational residents, adding to the costs of the permanent residents. The fishermen find it contradictory that the governmental policies speak of keeping 'a living archipelago' at the same time as the living conditions in the archipelago are getting increasingly difficult.

b. Conflicts relating to fishery policy. The coastal fishermen perceive their fishing methods as more traditional and sustainable than large scale fishery. This is mainly due to the fact that the gear used in coastal fishery is small-scale and selective (mainly targeting traditional species found in the archipelago). The common fishery policy is considered to support the large scale fishery, whereas the coastal fishery is marginalised and even fought back. The banning of cod caught in the Baltic is one example of this: the coastal fishermen argue that cod caught using small-scale, traditional methods should indeed be supported, whereas the cod caught by large-scale trawlers should be banned. The discussions related to eel fishery are perceived in the same way. From the coastal fishermen's perspective it is the method of production that should be controlled and restricted – not the geographical area or the species.

The external conflict factors are not part of a coherent storyline of the fishermen: here the observations are not interconnected logically or by arguments as in the storyline in opposition to the management plan where on topic is connected to another in a chain of arguments. The external factors consist of observations and experiences that are interpreted in a certain way. They are presented as an open list of arguments in a trial to set the seal conflict into context (preventing an isolating or reductionist view). It is the complexity of the conflict picture emerging then that makes it practically impossible to unfold this external context in form of a coherent and clear storyline: at more abstract levels of reasoning all context factors can be seen as connected with each other and merge into a hypercomplex diagnosis of the reasons and causes of the seal conflict. This would no longer allow to derive specific measures as done in the management plan; it would, however, require to initiate larger changes, for instance in fishery policy, which cannot be limited in its significance to a solution of a specific conflict.

Summary of Coastal Fishermen's Storyline

The coastal fishermen interviewed for WP6 display the same patterns of argumentation when relating to the conflict between seals and coastal fishery. The lines of argumentation constitute a web of interrelated facts, interests and values – a storyline created in opposition to the official Swedish policy for grey seal. The fisherman's logic of argumentation could be described the following way:

1. The compensation payments are very important to the fishermen and their perceptions of the possibilities to carry on with their fisheries. Though the fishermen are only compensated for approximately 50% of their reported damages, they seem to be quite content with the distribution methods applied by the regional administrations.

   However, the 'invisible' lost catch – that is potential catch scared away by the seal – can not be compensated according to the current rules. The fishermen hope that even the invisible losses will be compensated in the future.

2. The financial aid to purchase seal safe gear is generally considered to be positive. However, a part of the fishermen feel that the money is wasted on seal safe gear when there are other more efficient measures (like seal hunting) available. This group of fishermen are often fishing with eel traps or using nets. These kinds of fishery are still very hard to protect using the seal safe gear that has been developed until now: the Dyneema yarn or the pontoon trap.
3. The grey seal population is larger than estimated by the Museum of Natural History. The Museum should be seen as a stakeholder on the nature protection side of the

conflict, and the Environmental Protection Agency should not rely solely on their scientific knowledge but even take the local fishermen's knowledge into account.

4. Since the population is larger in reality, the quota for protective seal hunting should be adjusted: more seal can and should be hunted. The methods used are insufficient and inadequate: shotgun should be allowed for the hunting; seals should even be hunted from boat; and the seal protection areas are no longer needed.

5. The seal has lost its fear of humans and is now even feeding on gear and catch in the inner parts of the archipelago, where the fishermen haven't experienced it before. They believe that its fear of humans can only be invoked again if hunting is carried out using the methods mentioned above.

   Most fishermen think that there are specialists amongst the seal that are especially prone to damaging catch and nets by their feeding habits. This theory on seal behaviour has effects on the expected outcomes of the protected seal hunting.

6. The fishermen expect that the effects of an efficient protective hunting will be:
   a. That the specialists are removed from the fishing area, thus reducing damage on gear and catch.
   b. That the seals learn to fear humans and keep away from the fishing gear.
   c. That the seals are preferably staying in the outer parts of the archipelago.

   The fishermen refer to how seals behaved earlier on, when seal hunting was still allowed (using methods mentioned above) – and the connection between fear of humans and seal hunting is underlined.

7. Since the seal population is larger than officially claimed, there is no longer a need for seal protection areas. Fishermen should even be able to hunt for seal within the current protection areas to make the protective hunting more efficient.
8. From the fishermen's perspective, the main opponents to a solution to the conflict are:
   a. The Museum of Natural Science that are monitoring and researching the grey seal population and its behaviour. The museum is seen as a stakeholder on the seals side of the conflict; the fact that the museum is putting out grey seal pups to track their movements and study their behaviour is seen as an evidence of positioning in the conflict. Since the museum is in a favour of a large grey seal population, their knowledge should not be trusted as the only source (for instance on the size of the seal population).
   b. The Environmental Protection Agency is using the knowledge produced by the Museum of Natural Science, and hence the policy decisions are based on wrong assumptions (i.e. the population is really larger and therefore the quota for protective hunting should be larger etc.).
   c. The environmental NGOs and nature protection activists (referred to in a diffuse and imprecise manner) as well as the Green Party are seen as opponents by the fishermen. These groups are associated with the urban population and are perceived as unrealistic and ignorant of the rural realities.

d. The conflict between seal and fishery is placed within a larger discourse on the power distribution between urban and rural populations. The fishermen compare the conflict with the seal with other wildlife conflicts involving small-scale producers and wolf, lynx or bear etc. The politicians and authorities are considered to be too sensitive to the opinion of the urban populations, especially of the environmental groups within the urban population.

9. From the fishermen's perspective, the main external conflict factors that set the scene for the conflict are:

a. *Humanly induced environmental changes of the marine environment*. These changes include eutrophication, pollution and extensive large scale fishery. All of these affect the variation, reproduction and stock of the fish species. The coastal fishermen think that these changes affect their coastal fishery negatively since the recourse base is considered to be damaged or threatened by these humanly induced environmental changes.

b. *Non-human environmental changes of the marine environment*. This issue mainly addresses the cormorant problems that are widespread in the model region area. The fishermen consider the cormorant to be a threat to their livelihood just as serious as the grey seal. Though the cormorant causes no damage on gear, it is thought to damage and demand larger output from the fish stock than the seal does. Furthermore, the relatively high level of frustration with cormorants amongst the fishermen can be explained by the fact that there is still no specific management plan for cormorants in Sweden.

c. *Socioeconomic factors influencing coastal fishery*. The economic preconditions for coastal fishery have changed during the last 30 some years. Due to the environmental changes mentioned above the traditional stock of species found in the archipelago have been decreasing; at the same time as the stock of bulk species (primarily herring and cod) have been reduced. This was accompanied by socioeconomic changes such as lower prices (due to rationalisation, larger and more technical boats, as well as international competition and common fishery policy), fewer wholesalers (that set common prices according to the fishermen interviewed) and a more widespread need for capital investments in gear, boats etc. Furthermore the economic situation of the fishermen is influenced by societal changes in the rural areas. Due to increasing interest in the archipelago as a recreational area, the property taxes have increased and the areas are characterized by big differences in population density: few permanent residents and many summer residents. As a consequence of the new patterns of habitation, it has even grown more difficult to gain access to fishing waters: the summer residents are not interested in coastal fishery close to their recreational areas.

7.2.3 Other Stakeholders Involved in the Conflict Between Grey Seal and Coastal Fishery

The two storylines presented above are the only complete storylines found amongst stakeholder groups. No other group of stakeholders has as coherent storylines built on an interwoven logic of facts, interests and values. We call the further storylines "partial" or "fragmentary" because in these storylines the reasons, causes, measures and solutions to the

conflict are not thought through in such a logic of completion as in the management plan or by the fishermen. This can be partly explained by the facts that the management plan is a concerted effort in which scientific knowledge is the key, and that the fishermen are the only stakeholders directly affected by the conflict between grey seal and coastal fishery. They are forced to argument in detail, exactly and convincingly because of being damaged and threatened, being receivers of payments and subsidies, being offered a range of technologies and measures of mitigation which they cannot accept or use in a neutral way, without consequences. Every mitigation measure has concrete and different effects on the economic situation of the fishermen. Other stakeholders are able to accept the overall aims and measures presented in the management plan without defining their interests in regard to all mitigation measures. The fishermen need to unfold a counter-narrative to the official Swedish storyline (represented by the management plan) to protect their interests and explain their perspectives and views. Other stakeholders are in a more comfortable position to be defensive, to lean back and await the next action taken by the Nature Protection Agency.

The remaining stakeholders involved in (or with some interest in) the conflict between nature conservation (grey seal) and resource use (coastal fishery) position themselves in relation to the two main storylines described above. The management plan represents the official Swedish response to the conflict; and the storyline presented by the fishermen represents the oppositional storyline from the producer's perspective.

All remaining stakeholders are very well aware of the two main storylines and they use them in explaining their own position and to highlight similarities and differences between groups of stakeholders and positions. These other stakeholders relate their specific interests and values to some parts or details of the two main storylines.

Some of the more passive or awaiting attitude from the remaining stakeholders can furthermore be explained by

- *a culture of realistic politics*. The realistic politics that needs to be negotiated in everyday life on a regional (and national) level within the administrative units is reflected in a somewhat pragmatic and diplomatic attitude towards the conflict and its solutions. The need for consensus and agreement is very evident in the Swedish tradition of "remissförfarande"; the method of sending out proposals to main stakeholder groups to be referred for consideration. This was even done during the planning of the management plan for grey seal. This does not imply, however, that the referrals are being taken into consideration when finalising the plan; neither does it necessarily mean that all stakeholder groups with an interest in the matter are in fact heard.

- *Sectoralisation and focus on single point issues*. There is a tendency within the administrative units at regional and national levels towards sectoralisation. This is a result of the distribution of responsibilities and of the formal structure of the administration. As a consequence, the stakeholders at the regional and national administrative levels face problems with understanding and gaining access to dimensions of the conflict that are not situated within their sector and knowledge sphere. Often these perspectives are influenced by a more pragmatic and specialised view on conflict: as long as some mitigation measures are offered within the administrative framework it is suppressed

The NGO's perspective on the conflict might be influenced by a somewhat similar problem: the need to focus on a limited number of high profile issues. Not only is the ability to focus on

a broader number of issues limited by the NGO's specific profile of interest (be it specific species, habitats or issues); but the non governmental organisations exist in a very similar environment of realistic politics – the lobbying of issues demands great diplomatic and somewhat pragmatic skills. Sometimes certain compromises must be made to make sure that the greater cause or issue is protected.

In this discourse, WWF gives an example of this diplomatic and compromising attitude when accepting protective hunting on a limited number of grey seals. WWF principally thinks that the HELCOM recommendations should be followed (thereby banning all kinds of seal hunting, including the Swedish protective hunting). However WWF does not oppose the use of seal as a resource as such, it is the lack of international agreement trough HELCOM that poses a problem to WWF. It is vital for WWF that the Swedish state adheres all international agreements and recommendations – a protective hunting should not be started until HELCOM accepts this as a relevant measure.

Still, the WWF accepts that protective hunting is part of the Swedish management plan for grey seal. The main argument for accepting this is that protective hunting has positive psychological effects on the fishermen involved in the conflict and that the acute conflict is thereby mitigated.

7.2.3.1 Nature Conservation Perspective

The absence of nature conservation groups as local stakeholders in the seal conflict has been found as a dominant "unbalanced structure" in the conflict. The reasons for this absence of local protection interests are manifold but some core moments can be understood easily as soon as the organisational form of nature protection is regarded: nature protection interests are organised centrally, at national level, and do not representing one or several professional groups or interests but an "ideal interest" of the whole society which is reflected in the status of the nature protection organisations as voluntary organisations with honorary posts. Only a small staff of administrative and thematic specialists is working professionally for the large organisation – SNF and WWF are the most important nationwide organisations. They may do project work in nature and species protection, but both of them are not active in projects for seal protection: seal protection does not (no longer) require the active work and effort of NGOs after a legal protection status has been achieved which requires from the NGOs only a watching role. The nature protection NGOs, also the largest ones, do not have sufficient and experienced local members to be active in the seal conflict: the ones who are specialised in this issue are found in the headquarters of the organisation.

Both SNF and WWF are value based and voluntary organisations with a general interest in nature protection and both of them, according to their aims and programmes, have a consistent worldview with regard to nature and species protection in general – but not a consistent view with regard to their positioning in relation to the dominant interests and other interest groups in the conflict. Both groups defend the necessity of seal protection and do not compromise about this core argument, and they refer as well to the ecological knowledge about seal population as to the norms and regulations existing (HELCOM).

With regard to the measures in the grey seal management plan the conservationists have similar pragmatic attitudes as the "distanced observers" or passive stakeholders discussed below: they accept all the measures as "rational compromises" reached within politics and therefore legitimised, although they articulate their problems with protective hunting (less in the case of WWF) which is seeing as against HELCOM regulations but still understood and

tolerated. They also see the measures as temporary and partial solutions but not as solutions in the long run. However, the organisations do not think or work with long term solutions by their own, and they have no alternatives to present: in the long run their interest is guided by that of maintaining the seal population and the health of seals.

With regard to the positions and interests of the coastal fishermen the conservationist stakeholders keep the tacit agreement between the two groups – to identify each other as the opponent in the conflict but not to become active against the opponent or seeking direct confrontation. The containment of the conflict through the national management plan seems to a large degree to explain this non-confronting behaviour (from the model region no protests or activities of environmentalists against local fishermen have been reported; the environmentalists do not see the coastal fishermen as an opponent with whom they need to go in confrontation).

7.2.3.2 Regional administrative units

Nature protection units. The nature protection units have no responsibility for managing or implementing the management plan for grey seal. The only seal-related activity carried out at the nature protection units is the management of the seal protection areas within the counties. The monitoring of the areas is normally carried out using fishermen and other local people as inspectors. The actual monitoring of the grey seal population and its development is carried out by the Swedish Museum of Natural History (as mentioned above in section 7.1.2 on the management plan).

The lack of involvement in the actual implementation and monitoring of the management plan for grey seal could even explain the lack of involvement in the conflict displayed by the nature protection units at the regional level.
The persons interviewed at the nature protection units stressed the importance of protecting the grey seal to make sure that a healthy population can reproduce. All measures that would enable the seal population to regain its strength, at the same time as the conflict with the coastal fishermen is mitigated, were considered to be positive from the nature protection perspective. Since the nature protection units play no part in implementing the measures in the management plan, the personnel are not informed of the details of the measures and their practical implementation. However were compensation for damage on gear and catch and financial aid for seal safe gear welcomed by the informants, and these measures were even considered to be positive examples of mitigation measures.

Protective hunting is the one measure that was subject to more scepticism and discussion. The nature protection units in the model region (Östergötland and Södermanlands County) were inclined to be more positive to protective hunting than the nature protection unit in Kalmar just south of the model region. The informants in the model region argued that protective hunting is psychologically important for the fishermen to feel in control of the situation; and that the relatively limited number of seals shot in the model region would not affect the population negatively.

The inclination to see protective hunting only as a plague control was criticised by representatives from the nature protection unit in the model region, it was stressed that the seal hunting should be seen more as a resource in the future to be sustainable, and parallels were drawn to other types of game management such as moose and deer.

The nature protection unit in Kalmar was more sceptical to protective hunting as an acceptable mitigation measure. The general quota for protective hunting that is enforced in the model region in accordance with the management plan. This is not yet allowed in the counties south of the model region (Kalmar County, amongst others). However single personal licences to shoot seal that damage gear or catch can be issued and this has even been done in Kalmar during the last years.

The nature protection unit are not in favour of including Kalmar in the general quota for protective hunting: they feel that the population is still too weak and that the hunting carried out trough personal licenses will be sufficient. The unit even doubts whether protective hunting is an efficient measure for mitigating the conflict in the long run.

Fishery units. The fishery unit is responsible for implementing the management plan at the regional level. The fishery unit consider the applications for compensation payments as well as for financial aid to purchase seal safe gear. The conception of the conflict in the fishery units is very similar to the storyline found amongst the coastal fishermen. The representatives agree with the fishermen on most points, but the manner of expression is often softer and more diplomatic than amongst the coastal fishermen. As mentioned above, this could be explained by the need for diplomacy in the everyday life of a bureaucrat as well as by the structure of the responsibility in the administration. It should be stressed, though, that the fishery unit is the single most engaged stakeholder besides from the fishermen in this conflict. This stems from the fact that the informants at the fishery unit are very concerned with the future for coastal fishery; they have witnessed a reduction in active fishermen during the last 20 years, and the grim perspective is further enhanced by the fact that very few youngsters are interested in investing in or trying out the business. Other external factors (see storyline in opposition) are mentioned as part of the problematic embedding of the coastal fishery: the damages caused by seal (and even by cormorant) are considered to be the final staggering blow to the business.

The measures in the management plan are generally well thought of at the fishery units as such, but in most cases they are considered to be too weak and implemented at a too late stage of the conflict.

The compensation payments for seal damage on gear and catch as well as the co-financing of seal safe gear is considered to be a natural part of the Swedish state responsibility. The financing is considered to be underestimated in all three counties, and the need for better guidelines for distributing the funds as well as more actual funding is often highlighted. There is some scepticism towards the efficiency of the seal safe gear, primarily on account of the fact that no method has proven to be efficient on nets, and to some extent, on eel traps.

The main complaint from the storyline in opposition is echoed by the fishery units: the seal population is considered to be much larger than officially claimed; and the quotas for protective hunting should be larger as a consequence of this. The representatives find that the Environmental Protection Agency has postponed the decision to authorize protective hunting until it was too late. The fishery units opt for larger quotas for protective hunting at least, and for general hunting at most.

The fishery unit in Kalmar is very critical towards the fact that Kalmar county (and other counties

south of the model region) are not included in the general quotas for protective hunting according to the present management plan. It is argued that higher quotas for seal hunting are needed in Kalmar if coastal fishery is to survive the damages caused by grey seal.

The representatives at the fishery units even share the same view on the other stakeholders as do the fishermen: again the views are often expressed in a softer manner, but the essence is similar. It is the Swedish Museum of Natural History that produces the inaccurate knowledge used in the management plan, and the Environmental Protection Agency are too affected by the urban nature protectionists to make bold decisions.

Conflict involvement and relationship between the units. The nature protection units are not very active in this conflict, if at all. They are not part of the implementation or monitoring of the management plan – and therefore there is limited knowledge on the specifics of the measures or their concrete efficiency. It would seem that the nature protection units are somewhat marginalised in this aspect: there is no room for cooperation or compromising between the interests represented by the nature protection unit and the fishery unit at a regional level embedded in the management plan.

The fishery unit at the regional administration is the one single stakeholder, apart from the coastal fishermen themselves, that is very active on the fishermen's' side of the conflict. As it is the role of the fishery unit to enable fishery and keep the business living and thriving in the region, this seems quite natural. The personnel at the fishery unit is involved in the management and implementation of the management plan and thereby has gained detailed knowledge of the economical situation of the fishermen as well as mitigation measures and their perceived efficiency.

7.2.3.3 National authorities

Since the Environmental Protection Agency and the Board of Fisheries are such big institutions with a widespread variety of responsibilities and commitments, it can prove quite difficult to extract the general view on such complex issues as the grey seal/fishery conflict without ignoring some of the nuances. Still, in this discourse analysis we attempt to investigate such general perspectives, though we are aware that variations within the institutions will obviously (and most likely) occur. The general perspectives are investigated by interviewing key persons involved in the planning, implementation, monitoring or evaluation of the management plan in the organisations.

Environmental Protection Agency (EPA). The Environmental Protection Agency is in charge of designing and monitoring the management plan for grey seal in Sweden. Some of the monitoring is handed over to the Swedish Museum of Natural History, but the bringing together and evaluation of facts is done by the Environmental Protection Agency in accordance with governmental and legislative decisions on nature protection, game management etc.

Though the management plan for grey seal can not be seen as a direct expression of the views within the Environmental Protection Agency, it is not far off. EPA consults main stakeholders by sending out referrals for consideration, and in their own view this is an attempt to incorporate the many different perspectives into the management plan. But from the EPA informant's perspective, the management plan is very much shaped according to the present national and international rules, regulations and policies governing nature protection, management of wildlife and compensation for damages induced by wildlife.

Apart from the decision to allow a yearly quota of 170 grey seals for protective hunting, the mitigation measures ain the management plan are considered to be quite traditional and in compliance with normal procedures concerning wildlife and damages on resources. The EPA admits that the decision to allow protective hunting, despite the fact that HELCOM has not yet recommended it, was rather bold. Still, the populations were considered to be strong enough to endure the limited hunting pressure.

The EPA representatives find that all measures that can help mitigate the conflict are helpful – still the exact effects of the measures are still not investigated enough to evaluate their efficiency. The compensation schemes are considered to be efficient since they are well sought after; and the seal safe gear can be considered to efficient in all the cases that the number of reported damages is diminishing. The effects of the protective hunting are still a bit more hard to evaluate – but the EPA consider the psychological effects on the fishermen's sense of control to be high enough to agree to it.

The future perspectives of the mitigation measures are a bit harder to predict from the EPA perspective. Generally the damages induced by wildlife (wolf, lynx, bear, grey seal etc.) are escalating. The grey seal is still the species causing most damage (and thus releasing most in compensation damages) but with increasing populations of wolf, bear and lynx (as well as cormorants which are not yet included in the compensation damages), it is growing increasingly difficult to meet the demands of the producers. The EPA informants predict that it will not be as easy to compensate seal-induced damages in the future without generating much higher total funding for compensation schemes.
This implies that the EPA would like the remaining measures (development of seal safe gear and protective hunting) to generate more of the mitigation effects in the future.

National Board of Fisheries (NBF). The NBF is responsible for the technical aspects of the management plan; that is mainly the development of seal safe gear and the monitoring of seal induced damages on catch and gear. The key stakeholder group involved in this has been the Project "Seals and fishery", which is co-financed by the Board and the EPA. The personnel involved in this project are mainly scientists from the Board of fisheries. Since this is a stakeholder group that is part of the scientific community – using scientific methods for knowledge production, dissemination and evaluation – the project will be analysed below within the "science" framework.

Generally, the work done on the conflict between grey seal and coastal fishery within the NBF focuses on the fishermen's perspective; that is on the aspects of the conflict concerning human resource use. As a consequence of this, the main motivation for the NBF is to help mitigate the negative effects of the increasing grey seal population for the fishermen: partly by estimating and monitoring the development of seal induced damages and their consequences for the fishermen, partly by helping the fishermen develop methods/gear that will reduce damages. The damage reduction combines new materials and technology (Dyneema yarn, Pontoon trap) with research on seal behaviour (acoustic devices etc.).

The measures included in the management plan are seen as necessary means of mitigating a conflict; however should they not all be taken for granted in the long run. The main priority for the NBF is to develop seal safe gear and methods to repel the animals from the gear or fishing zones. Though the compensation payments are considered to be vital at this point of the conflict (when the seal safe gear/methods have not yet proved themselves to be sufficiently efficient), they are not considered to be economically sustainable in the future.

Protective hunting is a mitigation method that is accepted and welcomed within the NBF. The effects of the protective hunting are not yet clear, and opinions diverge on this matter; still are the psychological effects on the fishermen considered to be very positive. As one informant from the NBF puts it:

"Before protective hunting was accepted, the conflict could not be discussed without ending up with discussions on hunting. Now that the fishermen are allowed to shoot a limited number of seals, we are able to discuss other measures and methods as well… It would seem that they are more content knowing that they are allowed to shoot the seal that is steeling from their nets – I think it's mainly psychological, really."

It should be noted that the NBF sees a special value in coastal fishery. As mentioned above, there are only a very limited number of small-scale coastal fishermen left in the archipelago, and the NBA acknowledges that this type of traditional fishery has special value, not only on account of it's small-scale and selective methods, but even for it's traditional knowledge and importance in the coastal communities, culturally as well as economically. The special value and importance of protecting the small-scale coastal fishery is often mentioned.

Conflict involvement and relationship between the authorities. Both of the national authorities are involved in the management plan in different ways: the Environmental Protection Agency is in charge of planning, monitoring and evaluating the management plan as a whole – whereas the National Board of Fisheries concentrates on the aspects concerning human resource use (in this case coastal fishery) and the possible methods of mitigating the negative effects of the population increase in grey seal for the fishermen.

It could be claimed that the sectoralisation of responsibilities enables the cooperation between the authorities; but it should be noted that it even enforces polarisation of perspectives. Though the everyday work between the authorities is characterized by a diplomatic and pragmatic tone, some vague discontent with the Environmental Protection Agency is voiced within the Board of Fisheries. It would seem that this mainly stems from the fact that the Board of Fisheries often cooperates very closely with the coastal fishermen, both concerning the evaluation of preconditions within coastal fishery as well as on the development of seal safe gear. The close relationship between fishermen and groups within the Board of Fishery generates a practical knowledge on the preconditions and difficulties that affect the fishermen meet – and this is sometimes reflected in a discontent with the more distanced perspective on the conflict that exists within the Environmental Protection Agency.

7.2.3.4 Science

The scientific group that deals with different aspects of the conflict between grey seal and coastal fishery consists of a limited number of key persons. Many of these cooperate within different projects, including the FRAP project. The overlapping of personnel makes it hard to tell the difference between perspectives and roles in all aspects – but still two important and influential stakeholder groups can be singled out. Both of these have great impact on, or are considered by other stakeholders to have great impact on, the conflict.

The Swedish Museum of Natural History (SMNH). The SMNH is responsible for monitoring the grey seal population for the management plan. As well as investigating the grey seal population development, research is carried out at the museum as to other aspects of seal behaviour and relationships between grey seal and surrounding environmental factors.

As demonstrated in section 7.2.2 *A Storyline in Opposition*, is the Museum of Natural History perceived as a stakeholder in the conflict by the fishermen. This perception could be partially explained by the fact that grey seal research (and especially research were seal pups are put out to investigate their migration patterns using radio-equipment) runs a risk of being seen as biased as such by the fishermen. The research could be interpreted as if SMNH is more interested in the grey seals than in finding solutions to the problem; and the fishermen feel provoked by the putting out of pups in areas that are already troubled by seal damage. But the main reason for perceiving the SMNH as a stakeholder on the seal side of the conflict is that the fishermen do not trust the population estimates presented by the museum.

The informants interviewed at SMNH are well aware that they have had a reputation of being grey seal conservationists. Besides the factors mentioned above, in the past some key persons at the museum have been very much against, for instance, protective hunting. It would seem that this attitude is now not dominating at the museum – the cooperation with other authorities and organisations is rather vivid at this point and the position of the personnel at SMNH is pragmatic as to what mitigation measures should be adopted. Several of the scientists at the SMNH cooperate closely with other seal related researchers such as Project "Seals and fishery" or FRAP.

As most other stakeholders, the SMNH are positive towards all measures that mitigate the conflict between grey seal and coastal fishery. Both the compensation schemes and the development of seal safe gear are considered to be valid mitigation option for the moment – however should the seal safe gear be prioritized in the future.

The more controversial issue of protective hunting is met with ambivalence: it is acknowledged that protective hunting has positive effects on the fishermen, who feel more in control of the situation. According to informants at the SMNH, the relatively limited number of grey seal that can be hunted each year (170 individuals according to the management plan) would not affect the population trend negatively. The only real objection to the Swedish use of protective hunting is that HELCOM has not yet approved of any kinds of hunting for grey seal. The line of argumentation is similar to the one presented by the WWF and SNF (section 7.2.3.1 Nature protection perspective): Sweden should adhere to international agreements and recommendations such as the ones presented by HELCOM so as not to jeopardize the value of international agreements.

As to the critique of the knowledge production within the SMNH, the problem lies more in differences between scientific and local knowledge and knowledge production from the SMNH perspective. The SMNH has no intention of being able to tell the exact number of grey seal in Swedsih waters: the population can only be approximately estimated. The estimate is based on reports from all coastal counties, where coastal guards and other authorised inspectors are making an inventory of grey seal in certain areas at a certain time. Hence it is stressed by the SMNH that the inventory is made in cooperation with many other stakeholder groups and representatives: coastal guards, inspectors from nature protection areas as well as for instance fishermen that are appointed to do the inventory. The method for doing the inventory as well as the collection and presentation of data is done by the SMNH but since the inspectors are not necessarily associated with the museum, the knowledge produced should be valid, it is claimed. The only more accurate method involves inventory done by plane during a few days, but the budget has not allowed for such methods so far.

To sum it up, the critique raised by the fishermen of the knowledge produced at the Swedish Museum of Natural History, is met by some scepticism by the museum. The knowledge is produced according to scientific methods, and the fact that these results are not in compliance with the ones expected by the fishermen is seen more as a reflection of the mechanisms of conflict than of the quality of the data. Since many of the scientists at the SMNH are doing fieldwork in close cooperation with fishermen, this difference in opinion on how to produce and evaluate knowledge is not new to any of the parties, and it is considered to be more or less part of the existing differences between different types of knowledge and knowledge production.

Project "Seals and Fishery". The research in the project "Seals and fishery" concentrates on developing methods and/or gear to prevent seal damage on catch or gear. This is done through research on seal behaviour and the testing of different methods and gear that would protect coastal fishery. The project is co-financed by the Board of Fisheries and the Environmental Protection Agency, but the researchers are primarily associated with the Board of Fisheries.

Just as in the researchers mentioned above, were the researchers in "seals and fishery" positive to the mitigation measures applied in the management plan. The compensation schemes were considered to be necessary for the time being, but would not constitute a sustainable coastal fishery in the future. Instead seal safe gear and methods should be prioritized – as well as finding sustainable methods for the overall resource use in the Baltic.

The main difference between the two groups seems to be that the staff in "Seals and fishery" tend to be more inclined to favour protective hunting as a mitigation measure. The project has cooperated with Finnish projects to reintroduce seal hunting and seal as a resource – the resource aspect is highlighted as an important factor in obtaining sustainable and efficient mitigation measures in the future.

The effects of protective hunting are not seen as purely psychological for the fishermen; though no final effects have yet been demonstrated, it is envisioned that the hunting will indeed prevent some seals from foraging close to the gear. The fact that HELCOM has not yet approved of hunting of grey seal is not raised as an important issue amongst informants in this group – rather it is the practical aspects of seal hunting that is focussed upon.

Conflict involvement and relationship between the scientists. The fact that the two groups of researchers mentioned above focus on different aspects of the conflict between grey seal and coastal fishery (SMNH: monitoring of grey seal population; and "Seals and Fishery": research on seal safe methods and gear) can easily be misread and interpreted as if the two groups can be divided into 'protectionists' (SMNH) and 'friends of fishermen' (project "Seals and fishery"). However, that would be a too simplified interpretation of a much more complex situation. The researchers are obviously influenced by the perspectives they are studying – not to mention by the types of themes and agendas that will generate future financing – this is not different than for any other group of stakeholders that depend on external financing, cooperation etc.

As the group of people doing grey seal related research is quite limited, it is even dependent on other perspectives and data beyond the ones created within the own projects. Furthermore, both groups of researchers are depending upon a close cooperation with the coastal fishermen for collecting data, testing out methods/gear or for discussions of present and future issues. This close cooperation even generates an awareness of the local, non-scientific issues at hand

in the conflict. These factors might explain why the researchers in both groups often apply a rather pragmatic approach to the conflict as well as to the mitigation measures.

It should be noted, that the researchers interviewed were the only stakeholders who were reluctant to classify the interaction between grey seal and coastal fishery as a 'conflict'. Rather the interaction was described as a result of competition over scare resources; as a result of changing preconditions both in the grey seal population and in coastal fishery; or as a result of ill defined policies on nature protection and resource management.

7.2.3.5 A Passive or Semi-passive Stakeholder - Sport Fishermen

Among the stakeholders who have little or no interest in becoming active and involved in the seal conflict count as an important one the sport fishermen organised in a nationwide association ("sportfiskare"). This organisation has not articulated special interests or taken position in the seal conflict with the arguments, that the kind of fishery and gear that sport fishermen use is not damaged by seals and moreover are the sport fishermen not economically dependent from the resource fish or its availability in a specific area. Both arguments are clear and simple, and explain sufficiently the formal role of the stakeholder that may be characterised as "a stakeholder not in conflict but observing the conflict". However, there are indirect links and connections between the sport fishermen and the model conflict or the core stakeholders. These indirect links

- derive from the fact that the sport fishermen are the largest group of fishermen active all along the coast and in inland lakes. They fish more than the professional coastal fishermen.
- The sport fishermen represent a "coming group" of fishermen which can be seen as pioneering in the socio-economic changes ongoing in coastal areas: they represent the "third sector" of leisure bound activities that are on the way to become the largest economic sector and factor both locally and regionally (the annual economic turnover of the sport fishermen is estimated to ca. 2 billion SEK).
- Through their being part of the non-commercial and leisure-time activity, the sport fishermen share some interests with the groups that the local fishermen identified as the "urban interests in the coast", that is, interests of summer cottage owners, tourists, leisure time activists all of which have an interest in a scenic and undisturbed coastal landscape and seascape with a rich marine and wildlife.

The sport fishermen are spread all over Sweden and have no local representation (regional resource centres from them exist at certain places at the coast; these centres may be seen as cores for forming specific roles of sport fishermen that may bring them closer to the seal conflict, for example: training wildlife and fishing guides). Their central organisation does not position as organisation in the conflict, but the interviews with representatives of sport fishermen showed a "distanced interest" in the conflict which can be summarised in the following cluster of arguments:

- Coastal nature has (more than for the nature protection movement) a value of its own which is not clearly defined but can be understood to be guided by the amenity value of the coast.
- Coastal natural resources are seen as a necessary component of "living coasts and archipelagos" (which includes a clear awareness of the state and quality of the coastal environment), but not with an "eco-centric" or "bio-centric" argument as in the national grey seal management plan. A new user perspective of the future coastal dweller unfolds paradigmatically – not defining resource use through profession, production and income, but through consumption and "livability".

- Coastal fishery is seen as an already economically marginalised sub-sector which has no chances to survive the hard economic competition, although there is a widespread sympathy for the small scale coastal fishermen throughout society and politics (a sympathy also shared by the sport fishermen).
- Nature protection is seen as a necessity for the sake of maintaining fish and wildlife for the "consumptive user", not only for traditional reasons of conservation and protection.
- The measures in the grey seal management plan are accepted by this stakeholder as it is understood to be the compromise (found between the stakeholders directly involved in the conflict) that everyone can support.

The interest base of the sport fishermen in the seal conflict is that of an observing stakeholder with a clear but distanced view of the economic and ecological changes at the coast. Therefore, this stakeholder may be able to prognosticate better future development than the stakeholders that are deeply involved in the conflict and do not look over the horizon of the present conflict. What sport fishermen representatives see more clearly is the coming "leisure and tourism society" at the coast which is no longer dependent on coastal fishermen (some of them may continue and find new roles, also as representing "relicts" from a former professional activity) and other primary producers, but to a large degree on the presence and the income derived from leisure and vacancy activities or services. The joint interests of this heterogeneous "touristic coastal society" are similar with regard to the amenity value of the coast and the availability of fish and wildlife. Certain economic activities which are presently undeveloped along the Swedish coast may become more important in the long run, and here come the seals and the fish up again:

- local tourism enterprises specialising on sightseeing in the archipelago (possible also as seal safaris) and
- organised fishing tourism (for which not only the availability of fish in coastal waters is necessary, but also forms of exclusive control and management of resources in coastal waters which do presently not exists, even not with private property of coastal waters that is hardly used for commercial purposes).

7.3 Variation of opinions amongst stakeholders

The following sections 7.3-7.5 will present the Swedish discourse on the conflict between nature protection (grey seal) and resource use (coastal fishery) in a generalised, aggregated manner. Obviously, some nuances of the discourse are lost through this procedure. This should be compensated for by the general overview and patterns that are uncovered by generalizing. Still we would like to stress the fact that the textual part of the discourse analysis and this, more generalized, graphical presentation should indeed be seen as complementary. Some of the main findings of the discourse analysis can easily be translated into themes and storylines; others reveal differences in how knowledge is produced, disseminated and perceived. It is important that these findings are not ignored in the local cases; though they may not always be of use in the comparative study or overall framework.

7.3.1 Introduction of themes

Based on the nodes created in QSR N6A a number of themes were aggregated from the discourse analysis. These themes are used as parts of the storylines and as more isolated issues by the stakeholders. The themes can be filled with facts, values and interests in different ways to fulfil the aims of the stakeholders using them. To highlight the patterns and

positions of the stakeholders in the discourse, the themes presented here are expressed as statements that can be agreed or disagreed upon.

Following themes were identified:

SEAL:

1. Official estimated seal population is correct. (This theme refers to the official estimated seal population produced by the Swedish Museum of Natural History and used in the National Management Plan for Grey Seal.)
2. Seal behaviour has changed. (This theme refers to the opinion that seal behaviour has changed during the last year, thereby creating damage.)

MEASURES:

3. Compensation payments are important to conflict mitigation. (Compensation payments for seal damage on gear and catch is important to the conflict mitigation.)
4. Compensation payments should include invisible damages.
5. Seal safe gear is an important part of the solution. (The funding of development and purchase of seal safe gear is important to the conflict mitigation.)
6. Protective hunting is efficient. (Protective hunting of grey seal is efficient in that it scares off seals/changes their behaviour.)
7. Protective hunting is too limited. (The existing quotas and methods for protective hunting are too limited.)
8. Seal protection areas are still needed.

KNOWLEDGE/POWER

9. The knowledge used in management plan is biased.
10. All stakeholders are notable to influence the process. (All stakeholders are able to influence the process off developing the management plan and other important aspects of the conflict related process.

ECONOMY:

11. Coastal fishery is endangered
12. Large scale fishery has affected income for coastal fishery.

EXTERNAL CONFLICT FACTORS THAT AFFECT COASTAL FISHERY:

13. Eutrophication has affected species and stock (Negatively.)
14. Cormorants are affecting species and stock. (Negatively.)
15. Access to water is a conflict in coastal fishery.
16. Common fishery policy affects coastal fishery negatively.
17. It does NOT matter that HELCOM hasn't approved protective hunting.

The themes will be used in the following sections to highlight the structure and patterns in the Swedish discourse.

7.3.2 Agreement on themes by main stakeholders

FISHERMEN

Importance to conflict management **High**		15. Access to water is a conflict in coastal fishery	1.Official estimated seal population is correct 2. Seal behaviour has changed 3. Compensation payments are important 6. Protective hunting is efficient 7. Protective hunting is too limited 9. The knowledge used in the management plan is biased 10. Not all stakeholders are able to influence the process 11. Coastal fishery is endangered 14. Cormorants are affecting species and stock
Medium	5.Seal safe gear is important	8. Seal protection areas are needed	4.Compensation payments should include invisible damages
Low		12. Large scale fishery has affected income for coastal fishery 16. Common fishery policy effects coastal fishery negatively	13. Eutrophication has effected species and stock 17. It does NOT matter that HELCOM hasn't approved seal hunting
	Frequency of use **Low**	**Medium**	**High**

Agreement on statements : red=disagreement black=neutral blue=high agreement

Agreement on themes by main stakeholders: Regional administration FISHERY UNITS

Importance to conflict management **High**		15. Access to water is a conflict in coastal fishery	1.Official estimated seal population is correct 3. Compensation payments are important 6. Protective hunting is efficient 7. Protective hunting is too limited 9. The knowledge used in the management plan is biased 10. Not all stakeholders are able to influence the process 11. Coastal fishery is endangered
Medium		5.Seal safe gear is important 12. Large scale fishery has affected income for coastal fishery	4. Compensation payments should include invisible damages 14. Cormorants are affecting species and stock
Low	2. Seal behaviour has changed 8. Seal protection areas are needed 17. It does NOT matter that HELCOM hasn't approved seal hunting	13. Eutrophication has effected species and stock	16. Common fishery policy effects coastal fishery negatively
	Frequency of use **Low**	**Medium**	**High**

Agreement on statements : red=disagreement black=neutral blue=high agreement

Agreement on themes by main stakeholders: Regional administration NATURE PROTECTION UNITS

Importance to conflict management **High**	5.Seal safe gear is important	17. It does NOT matter that HELCOM hasn't approved seal hunting	1.Official estimated seal population is correct 8. Seal protection areas are needed 11. Coastal fishery is endangered 13. Eutrophication has effected species and stock
Medium		3. Compensation payments are important	14. Cormorants are affecting species and stock
Low	2. Seal behaviour has changed 4.Compensation payments should include invisible damages 6. Protective hunting is efficient 7. Protective hunting is too limited 9. The knowledge used in the management plan is biased 10. Not all stakeholders are able to influence the process 12. Large scale fishery has affected income for coastal fishery 15. Access to water is a conflict in coastal fishery 16. Common fishery policy effects coastal fishery negatively		
	Frequency of use **Low**	**Medium**	**High**

Agreement on statements : red=disagreement black=neutral blue=high agreement

Agreement on themes by main stakeholders: Nature protection perspective/ NGO's

Importance to conflict management **High**		5.Seal safe gear is important	11. Coastal fishery is endangered 14. Cormorants are affecting species and stock 17. It does NOT matter that HELCOM hasn't approved seal hunting
Medium	16. Common fishery policy effects coastal fishery negatively	3. Compensation payments are important 4.Compensation payments should include invisible damages 6. Protective hunting is efficient 7. Protective hunting is too limited	1.Official estimated seal population is correct 12. Large scale fishery has affected income for coastal fishery 13. Eutrophication has effected species and stock
Low	8. Seal protection areas are needed 9. The knowledge used in the management plan is biased 10. Not all stakeholders are able to influence the process 15. Access to water is a conflict in coastal fishery	2. Seal behaviour has changed	
	Frequency of use **Low**	**Medium**	**High**

Agreement on statements : red=disagreement black=neutral blue=high agreement

Agreement on themes by main stakeholders: SCIENCE

Importance to conflict management **High**			4.Compensation payments should include invisible damages 5.Seal safe gear is important 17. It does NOT matter that HELCOM hasn't approved seal hunting
Medium	16. Common fishery policy effects coastal fishery negatively	2. Seal behaviour has changed 3. Compensation payments are important 6. Protective hunting is efficient 7. Protective hunting is too limited 13. Eutrophication has effected species and stock	1.Official estimated seal population is correct 14. Cormorants are affecting species and stock
Low	9. The knowledge used in the management plan is biased 15. Access to water is a conflict in coastal fishery	10. Not all stakeholders are able to influence the process	8. Seal protection areas are needed
	Frequency of use **Low**	**Medium**	**High**

Agreement on statements : red=disagreement black=neutral blue=high agreement

Agreement on themes by main stakeholders: National authorities NBF[17] and EPA [18]

Importance to conflict management **High**		5.Seal safe gear is important	11. Coastal fishery is endangered 17. It does NOT matter that HELCOM hasn't approved seal hunting
Medium	4.Compensation payments should include invisible damages	1.Official estimated seal population is correct 3. Compensation payments are important 6. Protective hunting is efficient 12. Large scale fishery has affected income for coastal fishery	13. Eutrophication has effected species and stock 14. Cormorants are affecting species and stock 16. Common fishery policy effects coastal fishery negatively
Low	2. Seal behaviour has changed 8. Seal protection areas are needed 10. Not all stakeholders are able to influence the process 15. Access to water is a conflict in coastal fishery	7. Protective hunting is too limited 9. The knowledge used in the management plan is biased	
	Frequency of use **Low**	**Medium**	**High**

Agreement on statements : red=disagreement black=neutral blue=high agreement

[17] National Board of Fisheries
[18] Environmental Protection Agency

7.3.2.1 Textual description of most important patterns in graphs

The graphical presentation in section 7.3.2 presents the main stakeholders opinions on the themes presented above. The agreement on the themes as well as the frequency of use and importance to conflict management is presented for each individual stakeholder.
The main stakeholders are: fishermen, regional fishery units, regional nature protection units, nature protection NGO's, science and national authorities (National Board of Fisheries and Environmental Protection Agency).
Based on the graphs it can be said that:

- The opinions of the fishermen and the fishery units often coincide on most statements. The themes with witch they are preoccupied concern knowledge production and influence on the management plan, efficiency and importance of protective hunting and compensation payments, lack of efficiency concerning seal safe gear and effects of other external conflict factors.
- The opinion of the remaining stakeholders on the themes does not vary very much. The nature protection units, NGO's and science section are preoccupied with all aspects of protective hunting, and with the importance and efficiency of other measures.
  The science section and the national authorities are more inclined to act neutral to the themes than other stakeholders.

Importance of the graph for the national case study and for international comparison:

- Though the graph is detailed for each stakeholder, it does not give an easy overview of the relationship between the stakeholder's positions and themes and measures.
  To present a better overview graphs *7.3.3 Variation of opinions amongst stakeholders by management options* and *7.4.1 Aggregation of opinions: Agreement on themes amongst all stakeholders* is recommended.

7.3.3 Variation of opinions amongst stakeholders by management options

Attitude: Positive: Stakeholder's attitude to management option is positive,
Neutral: Stakeholder's attitude to management option is neutral,
Negative: Stakeholder's attitude to management option is negative

I = Importance to conflict management according to stakeholder: Low, Medium, High
F = Frequency that it is used by stakeholder: Low, Medium, High

Stakeholder	**Fishermen:**	**Regional administration Fishery unit**	**Regional administration Nature unit**	**Nature protection perspective: NGO's**	**Science**	**National authorities: NBF[19] and EPA[20]**
Measures in management plan:						
Compensation for damage on catch or gear	Positive F = High I = High Comment: Necessary. Even invisible damages should be included	Positive F = High I = High Comment: Necessary. Even invisible damages should be included (but not likely)	Positive F = Low I = Medium Comment: All strategies that calm down fishermen are positive	Positive F = Medium I = Medium Comment: Good temporary solution	Positive F = Medium I = Low Comment: Necessary temporary solution, not sustainable as permanent solution	Positive F = Medium I = Medium Comment: Good temporary solution, future perspectives uncertain
Financial aid to develop/obtain seal safe gear	Neutral F = Medium I = Low/Medium Comment: Positive that something is done to find solutions; scepticism whether gear will be efficient	Positive F = Medium I = Medium Comment: Positive that something is done to find solutions; some doubt if it will do for all types of fisheries	Positive F = Low I = High Comment: All strategies that calm down fishermen are positive	Positive F = Medium I = High Comment: Good solution, even in the long run	Positive F = High I = High Comment: Good solution, even in the long run. More research needed.	Positive F = Medium I = High Comment: Good solution, even in the long run. More research needed
Stakeholder	**Fishermen:**	**Regional administration Fishery unit**	**Regional administration Nature unit**	**Nature protection perspective: NGO's**	**Science**	**National authorities: NBF[21] and EPA[22]**

[19] National Board of Fisheries
[20] Environmental Protection Agency

Protective hunting	Positive F = High I = High Comment: Necessary and efficient. Quota too low, restrictions too hard.	Positive F = High I = High Comment: Necessary and efficient. Quota too low, restrictions too hard.	Neutral/Negative F = Low I = Low Comment: Not necessary, not efficient.	Neutral F = Medium I = Medium Comment: Important for fishermen. Future HELCOM approval is important	Neutral/Positive F = Medium I = Medium Comment: Important for fishermen. Future HELCOM approval is important	Positive F = Medium I = Medium Comment: Important for fishermen.
Measure not in management plan: **Seal protection areas**	Negative F = Low I = Low Comment: Seal protection areas are no longer needed	Negative F = Low I = Low Comment: Seal protection areas are no longer needed	Positive F = Low I = Low Comment: Seal protection areas are still needed	Positive F = Low I = Low Comment: Seal protection areas are still needed	Positive F = Low I = Low Comment: Seal protection areas are still needed	Positive F = Low I = Low Comment: Seal protection areas are still needed

[21] National Board of Fisheries
[22] Environmental Protection Agency

7.3.3.1 Textual description of most important patterns in graph

The graphical presentation in section 7.3.3 presents the variation of opinions amongst stakeholders by management options. The opinions on measures in the management plan are presented for each individual stakeholder regarding their attitude to it, the frequency of use and importance to conflict management. The main stakeholders are: fishermen, regional fishery units, regional nature protection units, nature protection NGO's, science and national authorities (National Board of Fisheries and Environmental Protection Agency).
Based on the graph it can be said that:

?? Most measures are considered to be positive by all stakeholders as long as they mitigate some aspects of the conflict. Whether the effect is psychological (on the fishermen) or ecological (on the seal behaviour seems secondary.
The fishermen and the regional fishery units are the only ones who trust the ecological effects of protective hunting. National authorities, science and NGO's do not consider compensation payments as a sustainable long term solution; whereas the fishermen and fishery units would like the compensation payments to include invisible damages as well in the future. The fishermen and fishery units are more sceptical towards the effectiveness of seal safe gear than other stakeholders who find this measure very important. The fishermen and fishery units do not think that seal protection areas are needed anymore.

Importance of the graph for the national case study and for international comparison:

?? The graph provides a quick overview of the position of individual stakeholders as well as the variation between the stakeholders.

7.4 Aggregation of opinions

7.4.1 Aggregation of opinions: Agreement on themes amongst all stakeholders

Importance to conflict management **High**	9. The knowledge used in the management plan is biased 16. Common fishery policy effects coastal fishery negatively 1.Official estimated seal population is correct 17. It does NOT matter that HELCOM hasn't approved seal hunting	10. Not all stakeholders are able to influence the process 12. Large scale fishery has affected income for coastal fishery	3. Compensation payments are important 11. Coastal fishery is endangered 5.Seal safe gear is important 8. Seal protection areas are needed 14. Cormorants are affecting species and stock
Medium	4.Compensation payments should include invisible damages 7. Protective hunting is too limited		13. Eutrophication has effected species and stock 6. Protective hunting is efficient 2. Seal behaviour has changed
Low	15. Access to water is a conflict in coastal fishery		
	Frequency of use **Low**	**Medium**	**High**

Agreement on statements : red=disagreement black=neutral blue=high agreement

7.4.1.1 Textual description of most important patterns in graph

The graph presented in section 7.4.1 presents the agreement on themes amongst all stakeholders based on degree of agreement, frequency of use and importance to conflict management.
The graph represents a condensed picture of which themes that are disputed, how frequently they are used and how important they are considered to be.
Based on the graph it can be said that:

- There is a high degree of consensus on the fact that compensation payments are important to conflict mitigation, and that other external factors influence coastal fishery negatively. There is dissensus on themes that concern knowledge and influence, as well as over the effectiveness of several measures. The fact that only some of the stakeholders are concerned with these issues is reflected in the lower frequency of use.

Importance of the graph for the national case study and for international comparison:

- The graph provides an overview of what themes that are contested and to what degree.

7.4.2 Aggregation of opinions by management options: all stakeholders

Management options included in management plan:

- Compensation for damage on catch or gear
- Financial aid to develop/purchase seal safe gear
- Protective hunting

Management options not included in management plan:

- Seal protection areas

Importance to conflict management **High**		Financial aid to develop/purchase seal safe gear	Compensation for damage on catch or gear
Medium		Protective hunting	
Low	Seal protection areas		
	Frequency of use **Low**	**Medium**	**High**

Agreement on statements : red=disagreement black=neutral blue=high agreement

7.4.2.1 Textual description of most important patterns in graph

The graph presented in section 7.4.2 presents the opinions amongst all stakeholders on the specific management options based on degree of agreement, frequency of use and importance to conflict management.

Based on the graph it can be said that:

- There is a high consensus on the fact that compensation for damage on catch or gear is important to conflict mitigation. This is even mentioned frequently (however is it not evident from this graph that some stakeholders see this measure only as temporary whereas others think it should include more – these nuances are demonstrated more clearly in *7.3.3 Variation of opinions amongst stakeholders by management options*).
- There is a relatively high consensus on the fact that financial aid to develop and purchase seal safe gear is important to the conflict mitigation. This opinion is not stressed as frequently (as compensation payments), since fishermen and fishery units are not entirely convinced that the measure is effective.
- There is a high degree of dissensus on whether or not protective hunting and seal protection areas are important to conflict mitigation. Fishermen and fishery units are convinced that protective hunting is effective in scaring away seals, whereas other stakeholders see that it is effective from a psychological point of view, but not necessarily from an ecological. Similarly, the fishermen and fishery units think that the seal protection areas are no longer needed, whereas all other stakeholders find that they are still needed.

Importance of the graph for the national case study and for international comparison:

- The graph provides an efficient overview of which measures are contested and to what degree.

7.5 Alignment of stakeholders

7.5.1 Alignment of stakeholders by storyline and measure

STORYLINE OR MEASURE	General agreement of stakeholders		
	Positive	**Neutral**	**Negative**
Official Swedish storyline: Management plan for grey seal	EPA[23] Nature Protection NGO's NBF[24] Regional nature protection units	Science	Fishermen Regional fishery units
Specific measures in plan			
Compensation for damage on gear/catch	All stakeholders		
Development of seal safe gear	All other stakeholders	Fishermen	
Protective hunting	Fishermen Regional fishery units NBF and EPA	Science Nature protection NGO's	Regional nature protection units[25]
Oppositional storyline: **The fishermen's perspective**	Fishermen Regional fishery units	No other stakeholders disagree with all aspects of the oppositional storyline. All are either neutral or in disagreement with a few themes within the storylline.	

Agreement on statements : red=disagreement black=neutral blue=high agreement

[23] Environmental Protection Agency
[24] National Board of fisheries
[25] Some disagreement here: nature protection units within model region are neutral, wheras nature protection units south of the mo del region are negative.

7.5.1.1 Textual description of most important patterns in graph

The graph presented in 7.5.1 presents how main stakeholders cluster concerning opinions on storylines and specific measures in the management plan. The clustering is based on the degree of agreement of the individual stakeholders on a) main storylines (The management plan and the oppositional storyline) and b) individual measures in the management plan. Based on the graph it can be said that:

- ?? All main stakeholders but the fishermen and the fishery units generally agree with the official Swedish storyline that is presented in the management plan for grey seal. Generally the measures in the management plan are for the most parts agreed upon by all stakeholders with the exception of protective hunting where the science section and the nature protection units are more neutral, at the same time as the nature protection units disagree with the measure.
- ?? The oppositional storyline presented in the fishermen's perspective is supported by the fishermen and the fishery units. The remaining stakeholders disagree with the oppositional storyline in one or more aspects.

Importance of the graph for the national case study and for international comparison:

- ?? The graph provides an overview of how stakeholders cluster.

7.6 Conclusions

7.6.1 Where Could Further Knowledge be Helpful?

The Swedish grey seal management plan identifies knowledge gaps and describes further research and development activities to improve the conflict mitigation measures. In the management plan there is a detailed description of research to do. However, this diagnosis has been done in a rather traditional way, by identifying deficits and gaps of (specialised) scientific knowledge (mainly natural-scientific knowledge), without discussing other forms of knowledge, experience and sources to be used in the conflict. From the storyline presented in the management plan and from the preferences for certain mitigation measures there can be found how the conflict should develop over time, in search for more efficient solutions based on research and development: At first, as long as no alternatives have been available, and for immediate reaction to the conflict, there has been the corrective method of compensation payments. These methods should then be replaced by preventive solutions of the kind of seal safe gear or influencing the behaviour of seals to keep them away from fishing gear. Still at the moment compensation payments are seen as necessary although they may quickly run into budget problems.

In the conventional picture found within the management plan, further and future knowledge helpful to solve the conflict would be the search for and continual improvement of

- technical solutions (fishing gear) and
- (seal) behaviour-related solutions.

Both solution paths are based on the premise that it is mainly marine biological and fishery research that will help to solve the conflict. Other forms and sources of knowledge are not seen as relevant or effective for conflict solution – or they are negated. Through the discourse analysis two main alternatives have become visible, with other forms of knowledge and differing application of knowledge, to solve the conflict in the long run. Both alternatives have mainly emerged in the storyline of fishermen:

- the application of practical, local knowledge of fishermen for the solution of the conflict (which is combined with arguing for other forms of hunting seal) and
- the search for solutions to the conflict from a broader analysis of its context instead through single technical or behavioural solutions (this can be combined, although is not necessarily done by the fishermen, with the argument that the solution of the conflict does not come with its technical solution but with much more encompassing measures to maintain coastal fishery in the long run).

The context or external factors should be systematically introduced in the analysis of the conflict to allow for searching alternative methods and solutions to the ones presently discussed.

Both variants of further knowledge production,

- the continuation of fishery research that is already under way and
- the "transdisciplinary" alternatives emerging from the discourse analysis

need not to be seen as mutually excluding, but can also become complementary. However, the alternative variants would require a change of the scientific and bureaucratic mindsets that dominate conflict management presently - and the chances for such a change are not big: the discrimination of fishermen´s local knowledge has been a constant phenomenon and it will be complicated to break the monopoly of (a certain form of) science for conflict management, especially when the research is already understood to be applied research in close contact and cooperation with fishermen (although not in participatory research). The other argument ("contextual solutions") is in line with rather long conflict research that has resulted in the concept of conflict – "provention" as context based approach to solutions. But this argument will meet difficulties to be accepted by the stakeholders in power and the public agencies because this perspective might be seen as an unrealistic search for solutions to much larger problems than the conflict. In a bureaucratic view the conflict can be mitigated rather simply through temporary technical and monetary solutions, whereas the strengthening of the economic role and position of coastal fishermen seems as something that all concerted effort of Swedish society cannot achieve against the powerful trends of economic competition and concentration.

Although the "contextualisation" of the conflict or its re-framing in an overall diagnosis of the situation and the changes in fishery economy and in coastal fishery are not leading to direct and lasting solution of the seal conflict, it is through such re-framing that the conflict can be understood in its ramifications and then also alternative solutions or mitigation methods can become visible.

7.6.2 Implications for RAP

More than in the present grey seal management plan, future efforts to mitigate the seal conflict can be given a clear direction and rationality with the following premise:

There is already an advanced process of conflict mitigation which includes research and different policy instruments in a management plan. This management plan is the result of a compromise where all stakeholders had some degree of influence (being heard in the formulation process). Therefore, it is practically impossible to develop conflict mitigation further without relating to the present plan, the experiences with it, and the willingness of stakeholders to be engaged in further or different efforts to manage the conflict. From this premise follows a suggestion for the further management process - first to review the

management plan and then to develop, by way of building consensus between the stakeholders, alternatives and new methods or measures to conflict management:

(a) A review and evaluation of the management plan and the mitigation measures that does not include only a traditional expert based evaluation but also participation of the stakeholders in this evaluation can be a way to move the conflict closer to long term solutions than presently available.

(b) An active search for alternatives to conflict management in the procedural dimension (through strengthening of participatory components of conflict management) and in the direction of developing more context-based solutions can be a subsequent decision, following the consensus found between the stakeholders.

The most concrete proposals at this stage of research that can be supported from the results of discourse analysis can be derived from the two alternative views about the conflict that have been articulated most clearly by the fishermen, the requirement to look at external or context factors and to include local knowledge in conflict management:

(a) External factors the influence the seal conflict should not only be brought into discussion for reasons of conflict management, but for the larger purpose of developing coastal fishery so that it has a future (this idea is symbolically accepted in Sweden, but there is a lack of realistic proposals for that). This could happen through the formulation of a second management plan in connection with that for seals – a "management plan for coastal fishery" that designs regional and local strategies to develop coastal fishery which is a marginalised and endangered sub-sector of fishery.

(b) Generation and dissemination of knowledge related to seals and coastal fishery should happen in broader perspectives – not only scientific knowledge but also local or practical knowledge should be included. Furthermore, knowledge should be exchanged more actively between the sectors, administrative units and stakeholders (knowledge integration).

7.6.3 Possible Lessons and Generalisation

The Swedish seal conflict is already a long-lasting conflict with an advanced mitigation procedure which cannot go on for very long time. The conflict is presently so much dominated by the measures applied for its mitigation that these dominate the discourse and become candidates for learning about workable solutions to such conflicts.

1. A lesson that would have been possible to learn through the seal conflict again and without discourse analysis is: Compensation payments have worked to mitigate actual damage and are effective as temporary methods, but they do not support innovation and solutions in the long run. This is a conventional bureaucratic lesson, but not so important for the stakeholders directly involved on one side of the conflict, fishermen or nature protection associations – for the fishermen compensation payments appear as necessary whether they are effective as mitigation measures or not, they have also the important effect of supporting them economically.

2. The controversial theme of hunting of seals (or other wildlife that) is in a blocked situation that has come with its design as an exceptional and experimental approach under the dominant HELCOM-rule that hunting should not be allowed. To free the hunting question from the limited alternatives of technically complicated protective hunting and more simple

traditional hunting (with other weapons, from the boast) at first a change of HELCOM agreement is required. However, it is not enough just to open again the legal possibility for hunting seals. Only when hunting is combined with use of the hunted animal as resource it can be motivated and find consensus. The return to former forms of hunting is not enough as long as seals are not used as a resource – but it is not realistic that this resource use can be the same as formerly, before industrialisation.

3. The two classes of preventive mitigation or solution measures that have proven their higher efficiency (although not always according to the fishermen), technical solutions for fishing gear and behaviour-related methods for seals, require more than their further development and perfection under the tutorship of science. The interest-based positions of two core stakeholders, fishermen and nature protection associations help to make visible different side-effects and unanticipated consequences that cannot sufficiently be taken into account by scientists and bureaucrats when designing such methods and measures – through their application some of the methods become (again) subjected to ethical and normative assessments.

4. The seal conflict has allowed to learn a lot about the strategies and behaviour of the stakeholders under a specific conflict management culture that is dominated by bureaucracy and science. It seems that important lessons or cases for generalisation for further conflicts are not the very arguments, strategies and modes of behaviour of the stakeholders, but that all these action components are dependent variables – dependent on the conditions and constraints offered by the formal and informal, factual and normative frames (in policy and legislation) that define the potential space for solutions. Much more important than the observed abilities of single stakeholders to defend their interests, to compromise or to co-operate, are the legal, political, economic and scientific definitions of the situation and the possible solutions. Although these "boundary conditions" are also defined by specific stakeholders, they are of different quality, and there is a clear distinction between the "actual stakeholders" in the regional or local conflicts and the "programming stakeholders" at higher levels of power and influence.

7.7 Appendix 1: Detailed Analysis of the Storyline of Coastal Fishermen

During this discourse analysis a total of 27 key persons in all relevant stakeholder groups were interviewed. The interviews were taped and transcriped, and then processed using QSR N6 software. The text units of the interviews were categorized to create an overview of the important themes in the discourse as well as of the clustering of arguments and stakeholders. The themes created during the process will be used as a base of analysis, both in the presentation of the storylines as well as in the later graphical presentation of opinions, storylines etc. in sections 7.3, 7.4 and 7.5.

As a group, the coastal fishermen are the only stakeholders that have a coherent storyline built of interrelated assumptions of facts, interests and values. The storyline is created in opposition to the official Swedish storyline presented in the National Grey Seal Management Plan. The fishermen's storyline is not presented or produced in a written or structured way, as the management plan is, but still the argumentation, the logic of the facts, interests and values presented build a coherent and homogenous line of thought amongst the fishermen.
The storyline presented here only relates to what can be seen as 'internal conflict factors'; that is factors that are described to be directly connected to the conflict between grey seal and fishery.
During the interviews even 'external conflict factors' were addressed by the fishermen. These conflict factors are not directly related to the management plan, but should be seen as background factors in which the conflict is set.

The main areas that are contested in factual terms are:

- The size of the grey seal population and its reproductive rate.
- The effects that can be expected of the protective seal hunting.

These contested areas are very often used by the fishermen as a starting point for their argumentation. In the following sections the fishermen's perspective on the facts and the way they are used in the storyline is highlighted.

Differences within the stakeholder group
Fishermen from 3 different regions were interviewed. The Swedish model region in FRAP consists of the two counties Södermanland and Östergötland. 6 fishermen from these counties were interviewed, were only a total of some 50 fishermen are still carrying out coastal fishery. The average age is 50+ and the fishing methods concentrate on traditional species found in the archipelago such as pike, perch, sander and eel.

In 2003 protective hunting for a total of 25 seals was allowed for the first time in the model region (before this seal hunting had only been allowed according to individual hunting licences when damages were considered to be very serious). Still counties south of the model region have not been given the opportunity to carry out protective hunting from a general quota.
To investigate the impact of protective hunting as a measure, interviews were even carried out with the very same stakeholder groups in Kalmar county south of the model region were protective hunting is yet not allowed. Here a group of 4 fishermen were interviewed. The coastal fishery in Kalmar county is more widespread and almost 200 coastal fishermen are

active in the county (the coastal line is long and includes the large island Öland as well). The fishery concentrates on some of the same species found in the archipelago as in the model region. However more fisheries in the county is carried out in the outer parts of the archipelago, and more fishermen rely almost entirely on eel fishery.

The fishermen from Kalmar agree with the fishermen from the model region in almost every way, hence the total storyline is the same for the two groups. The one major difference relates to protective hunting: since protective hunting is not yet allowed in Kalmar, the fishermen are much more preoccupied with this measure. They argue that an extensive protective hunting is needed in Kalmar County as well, and that it is unjust not to allow hunting in the southern parts of the Baltic as well (Kalmar, Blekinge and Skåne County). The facts, interests and values drawn upon and the way they are used concerning protective hunting are the same as for the fishermen in the model region. The difference seems to be that the fishermen in Kalmar are focussing very much on this one measure that is withheld from them; and as a consequence of this the level of frustration seems much higher. The same lines of argumentation and perspectives on the seal/fishery conflict that are found in the model region are aggravated and stressed by the fishermen in Kalmar. This can be connected to one of the main effects of the protective hunting (stressed from all sides in the conflict, including the fishermen in the model region): that the protective hunting allows fishermen to feel somewhat in control of the situation thereby relieving some of the frustration.
Since no significant differences are found in the storylines presented by the fishermen in the model region and in Kalmar County, the fishermen from Kalmar will be included fully in the storyline presented below – in the one case that minor differences are found this will be stressed.
All quotes presented in the following section are from fishermen.

The Management Plan for Grey Seal

Since there is a management plan for grey seal, the discourse amongst the fishermen is often focussed on the measures in the plan. The fishermen are not opposing the idea of a management plan for grey seal as such; neither are they opposing all the measures applied in the plan.

Compensation payments

In node *7.1Mearures/compensation, damage* and *7.1.1 Measures/compensation/invisible losses, expected catch* the fishermen's perspective on compensation payments is reflected. The fishermen all stress the importance of the compensation payments for damage on catch and gear. According to the fishermen, the possibilities to carry on with coastal fishery despite the seal damages are depending on the compensation payments.

"I think that it has worked out just fine. Surely we have been paid quite well to cover some of our losses."

Generally, the fishermen get approximately 50% of the compensation they apply for, and the majority of the fishermen are quite content with this. However there are even fishermen that argue that the compensation should cover all the losses:

"At the very first meeting I said: OK, you can establish a seal protection area – but then we want to be absolutely sure, and get in writing, that we will get compensation as soon as the seal population is restored. Naturally, we didn't get that, and I was not invited to any more meetings after that. (…) Yes, they promised to compensate our losses 100%. For 2002 the

Board of Fisheries estimated that the damages amounted to 50 million, if I'm correct. And we only got 18 million…so it's far from it."

Though some of the fishermen think that the application forms are too complicated, they are content with the distribution of compensation that has been carried out by the regional administrations. The new model for distributing the compensation payments between fishermen that is being developed by the Board of Fisheries is met with a certain amount of scepticism: the fishermen fear that the model will result in lower compensation payments.

"Well, until now the compensation has been based on the fisherman's income prior years and the reported seal damages. But they are changing all that now. It seemed as you were now supposed to calculate the income for the entire family. And that doesn't make sense…but I don't know. We'll just have to wait and see. But it seems a bit complicated. I read some paper about it."

The main complaint concerning the compensation payments is that the 'invisible' losses are not compensated. The compensation is first and foremost given to balance the costs for damage on gear (to repair nets etc.) and secondly for the damages caused on catch. Sometimes damaged fish are left in the nets or a trap, yet again other parts of the catch is escaping when seals damage the nets or traps. This direct loss can be calculated based on fishery statistics from other days or years when the seal hasn't damaged the gear.
The 'invisible' loss of catch is the fish that is either scared away from the gear by the seal, or the fish that is eaten from the nets leaving no trace behind. The fishermen estimate that this kind of loss is significant; and they would like to be compensated for these losses as well in the future.
"(…) somehow the eel is passing by without being trapped in our gear. I don't think that it can be explained by lack of stock, they just pass on by. And then you start to wonder why? I believe that the seal is the villain in the drama. Hypothetically, you can imagine that the eel catches up on the seal being near the gear. And that the eel learns to avoid that area. That's my theory."

"Then there's this invisible damage that we can't estimate: how much of the catch is scared away by the seal? It is possible that it scares the eel away. Lax and the like of it are surely scared away because they hunt them outside the basins and leading arms and stuff. That's what the researchers say as well; that the fish senses the seal. Then they know that it's time to leave the area! So you would imagine that a seal close to the gear would scare off a lot of fish. But that's really hard to measure and prove. But it could scare away 5 to 20 % - I don't know."

Some fishermen are even concerned that the compensation for damage on gear and catch will not be a part of the management plan in the future:
"It's a good thing that there is such a possibility. But you can't ever estimate your losses or how much you were supposed to catch if the seal hadn't been there. But it's really important that this possibility exists (compensation payments, editors comment). We'll have to see for how long though, because I think that they are going to take away that possibility. I don't think that seal safe gear will be sufficient here (in the model region, editor's comment.). We'll always need some compensation for the damage on gear and catch if you can't use the seal safe gear everywhere."

With regard to the theme "compensation payments for damage through seals" the fishermen´s core argument is rather simple. They are experts for assessing the damages, and their reflections concerning this theme and mitigation measure converge to the message "the measure is necessary and implemented quite well, however it could be improved with regard to certain forms and components of damage".

Seal safe gear

The possibility to apply for financial aid for seal safe gear is much appreciated amongst the fishermen. However, the group of fishermen using eel traps and nets are not as positive as the ones able to use Dyneema yarn (a strong yarn that is hard for the seal to rip apart) or the pontoon trap (a seal safe trap that is elevated by the use of air). The main reason for their discontent is that they don't think that the methods developed are suitable for their types of fishery.

"I heard that they are experimenting with some kind of trap that is suitable for eel as well, but I haven't seen it yet. That could be really important – that is if anyone is permitted to go on fishing for eel, since the EU is now considering banning the eel fishery. (…) But it would be really great and time saving if they were able to develop such a trap."

Fishermen in this group are even prone to be more sceptical towards the use of resources on developing seal safe gear; often they are more attracted to more offensive measures, such as extensive seal hunting.
Quote from a fisherman after arguing in favour of a more extensive seal hunt:

"Then we would save millions on the development of seal safe gear… It's all fine and dandy, but it costs enormous amounts to develop this kind of gear. (…) Well, it's hard to understand that such effort is put into the misery, really. They come up with stuff that is really… bois that pop up at a certain time – which is entirely inconsistent with our duty to mark the fishing spots. It all escalates. You just can't believe all the crazy stuff they are able to make themselves busy with."
The Dyneema yarn has been accepted as an effective and natural part of the fishery. The fishermen agree that the yarn has had positive effects in minimizing seal damage, and some even claim that the seal has learned to avoid the gear with Dyneema yarn:

"Vi received aid to buy this terribly expensive Dyneema yarn to make us able to protect ourselves a bit. And it worked very well; the seal grew tired of it as soon as we put out the gear with Dyneema yarn. Then it migrated further south were they hadn't had any damages before. And I'm quite sure that they recognise the types of nets we use and the colours on it. As soon as we put out old gear (without Dyneema yarn) it is torn apart."

"It is a bit difficult to sow with as it is so thick and stiff but we were paid to do that as well. But otherwise it has been entirely positive when you go through the fishing nets and that. (…) It's almost as if we have witnessed a change in seal behaviour since 60% of our gear has Dyneema yarn. It keeps the seal away."

There is some concern amongst the fishermen, though, that the seal is now trying to gain access to the fish further out in the traps (the Dyneema yarn is normally only applied in the inner parts of the trap). If this is a general trend, the fishermen might have to use the Dyneema yarn on all parts of the gear; witch could turn out to be quite expensive.

Several of the fishermen have invested in pontoon traps (often even referred to as 'push-up traps') that have proved to be efficient in the northern parts of the Baltic, especially for fishing salmon. The efficiency of the trap seems to be very depending on where it is placed. Some of the fishermen have had very good catches, whereas others are disappointed by the minimal catches. A content fisherman says:

"It is quite clear that this push-up trap works very well. It's my first year using it, but its working out just fine. We haven't seen a seal near the trap since we put it there. It was there all of the time before…above all: you could tell that it had been there! The gear was ripped apart and the salmon was half eaten. It even ate the bream. So it sure is a good thing – it's a great thing even!"

On the other hand a discontent fisherman says:
"It's very easy to through the nets but we haven't caught the amounts we had hoped for. We think that much of the fish might pass over it, but we even suspect that it might not be entirely suitable for the kind of fishery we do out here. We are thinking of modifying it a bit."

The disadvantages with the trap are that it is not suited for all kinds of fishery (for instance is the eel fishery not considered to be suited for the trap); that the success of the trap is depending on the position (it should be protected from hard winds and should preferably be placed where the fish normally follow the reefs); that it is not easy to move; and that the trap is easily overgrown in the nutrient rich waters of the southern parts of the Baltic.
The advantages with the trap are that it is improving the working environment of the fishermen (the trap is lifted without any manual labour and the catch can easily be emptied into the boat); that the size of the meshes only keeps the desired sizes in the trap (which saves time and work removing unwanted sizes; and that neither the seal nor the cormorant are able to damage the catch (even the cormorant damages fish in the model region). One of the fishermen says:

"Here (with the pontoon trap, ed.) even a child can go through the nets, if you just know how to. You just pump air into it and then you empty the catch into the boat. It isn't heavy at all. I tell you: it's really easy. The disadvantage is that you won't be able to empty it if it's too windy. But the basin is large enough to keep the fish for at least a week. I went away for ten days and when I returned none of the fish were dead. That's great. It's all great, really. I know of no other disadvantages than that you'll have to wait to empty it if it's windy. Of course it's a bit difficult to place it since it has to be somewhat still. And it can be a bit hard to move as well."

Even if not all fishermen are content with the catches so far; they are all interested in modifying and testing the trap to make it work. The trap is seen as a way of diversifying the fishery, thus enabling the coastal fishermen to stay in business despite of the seal damages.

"You could say that the push-up is way of finding new paths. If I can make it work – and above all: if I'm able to find the right spot for it – then I might even buy another one. Eventually that kind of fishery could replace the former methods – if it's economically viable, that is."

The trouble gaining access to water suited for the pontoon trap is part of a general problem gaining access to coastal waters for fishery (see external conflict factors below). The difficulty is further reinforced by the reactions to the pontoon trap from neighbours and non-

professional fishermen in the local community. By the look of it, the trap seems quite big, and the neighbours fear that the trap will devour all the fish in the area. One of the fishermen says:

"Sometimes the local people can be a bit sceptical; they might think that this new gear is incredibly efficient since it is so big. But it's not like that, really."

Even the fishermen themselves admit that they were quite sceptical of the pontoon trap at the beginning:

"Many (of the fishermen, ed.) are very negative. At the very beginning many said: this can't be applied here. That's what they said. But eventually the opposition weakens, so to speak. Generally fishermen tend to be quite conservative – that's no secret. But I believe that there is some acceptance of the gear now."

Not all fishermen see seal-safe gear as a promising method (differences depending on target species fished and effectiveness of gear for certain fish species). However, there is a main figure of argumentation emerging from their reflections about seal safe gear: to be accepted by fishermen seal safe gear should be technically efficient in preventing damage, but moreover a method which is contributing to the improvement and development of coastal fishery – then they are interested in testing, modifying or improving the gear (especially the push up trap which is seen as a way of diversifying the fishery, thus enabling the coastal fishermen to stay in business despite of the seal damages).

The disagreement on the size of the grey seal population and knowledge production

The dispute over the size of the grey seal population is often brought up in the interviews. In node *2.4 Return, seal/size of seal population* the contesting perceptions of the grey seal population are brought together.

Generally, the coastal fishermen claim that the grey seal population is much larger than expressed officially (in The Grey Seal Management Plan etc.). Some fishermen make reference to own observations of seal, other argue that reproductive rate is higher than officially claimed.

"Well, it's like I said earlier on… if the scientists haven't counted the seals, then it doesn't matter that we (the fishermen, ed.) or any other serious people have counted them. If the scientists haven't counted them then there are no seals. It's the same with the lynx. And it feels a bit sad when you see hundreds of seals and at the same time: there are no seals officially."

Another fisherman says:

"There are more seals closer to the coast now than there was before… Or perhaps I should say the opposite as well: there are even more seals in the outer parts of the archipelago than there used to be. Anyway, there's not any less!"

Since the Swedish Museum of Natural History has the responsibility to monitor and evaluate the grey seal population, their knowledge has great consequences. The national authorities rely on the scientific information produced when they plan and implement seal related measures.

The dispute arises when the local knowledge and perceptions of the fishermen differ from the scientific knowledge produced by the central institution.

The fishermen question the methods used by the Museum of Natural History, saying that the methods underestimate the actual grey seal population. The fishermen believe that this is a consequence of inadequate counting methods, but even more so: that the Museum of Natural History is indeed a stakeholder with a hidden agenda. It is repeatedly expressed by the fishermen that the museum is in favour of a large grey seal population and that this is characterizing the results and the methods.

This perception is reflected in node *6.1.11 Stakeholders in conflict/Talk about/scientists, Riksmuseet, säl&fisk.* Several of the fishermen and representatives of the fishery units describe the museum as the main stakeholder on the seal side of the conflict, and thereby also as the main obstacle to a future solution of the conflict.

"Question: According to your point of view, what are the main obstacles to obtaining a reasonable balance?
Answer: Primarily it's the Museum of Natural History. And the Green Party. They won't accept anything; they even put out more seals. (…) They fly down from Stockholm and put out seal. It costs fifty thousand, just to fly them there."

"But the seal protection areas have already fulfilled their role. It's ridiculous! We were talking to X from the Museum of Natural Science when delivering our seals to them (seals that have been shot or drowned in gear, editor's comment.). When you find that X then is putting out seals from a plane – then you get a bit suspicious. From our point of view it seems very unnecessary to do that."

The disagreements on the size of the seal population result in several things. The fishermen feel that the scientific knowledge used as a basis for the Grey Seal Management Plan is inadequate at best, manipulated at worst. The fact that the Swedish Museum of Natural History is perceived as a stakeholder makes the monopoly in knowledge production seem unfair to the fishermen. They feel that their local knowledge is not taken seriously and that the national institutions are manipulated by a stakeholder on the seal side of the conflict.

Connection between estimated seal population and protective hunting

The disagreement on the size of the seal population affects the measures to be implemented in the management plan. The disagreement is referred to in node *7.3 Measures/protective seal hunting* on several sub categories. The estimated seal population is particularly important in determining the quota that can be hunted. Node *7.3.2 Measures/protective hunting/quota* bears witness of this: the fishermen perceive the quota to be too restrictive and think that the seal could be hunted more extensively (or even as common prey) if the real numbers where acknowledged by the national authorities.

"Well, it's a good thing that we are allowed to shoot at them. But I don't know – quotas here and quotas there – I don't know if those kinds of restrictions that exist are really necessary."

The fishermen perceive the restrictions and regulations on protective hunting as too strict; this is expressed in nodes *7.3.1 Measures/protective seal hunting/weapon, 7.3.4 Measures/protective seal hunting/restrictions from boat* and *7.3.5. Measures/protective seal hunting/gathering.*
The current rules on protective hunting stress that all killed seals should be landed. This implies that hunting should only be carried out in places and with methods that ensure that the seal can be landed.

The seals must be hunted with shooting weapons (more specifically: class one weapons that use a heavy bullet with high impact), no traps are permitted. The hunting should be carried out from a firm position: land, ice or boat attached to land or ice. No hunting is permitted from boats floating freely.
From the fishermen's point of view, these rules are making the hunting very difficult. In the past, fishermen say, the seal has been hunted with shotguns from the boat whenever they were spotted[26]. The possibility to use shotgun instead of class one weapon is of great importance to the fishermen. There is a risk that heavy bullets will ricochet on the water surface when using class one weapons, and this makes the hunting risky when carried out in the inner archipelago near houses and boat life.

"From short distances a shotgun will do just fine – they die from the chock. (…) When you are out with the boat they will get very close, and you would be able to shoot them with a shotgun without any problems whatsoever. (….) But you can't shoot in the direction of the summer cottages – and you're not allowed to shoot from the boat either. It doesn't feel good to shoot class one bullets over the waters during the summer. They can travel a few kilometres and the summer cottages are no more than 1000 meters away. You just can't do that."

According to the Environmental Protection Agency, the rule of using only class one weapon is applied to ensure that no seals are only wounded during the hunting. The Environmental Protection Agency believe that the use of shotguns would increase the risk of wounding seals, just as the right to hunt from boats would.
On the other hand, the fishermen refer to former hunting methods and say that the use of shotguns is sufficient to kill the seal as it has a very weak scull structure, and that the risk of only wounding the seal would be no higher by doing so, especially if the hunting could be carried out from the boat at a very short distance from the seal.

"Experience tells us that the seals head is very fragile, the scull area that is, and that only leaves room for one of two possibilities: you either hit or miss."

The fishermen find the rule to only hunt from land particularly wrong and inhibiting since the seals are most often spotted from the boat when attending to the fishing gear. Even if it is possible to disembark in the inner parts of the archipelago it is very likely that the opportunity to hunt the seal is surpassed when the fisherman is in position on land. In the outer parts of the archipelago it is not always possible to get a shot from land since the fishing gear could be well out of sight several kilometres away from land.

"The difficulty consists of the restriction to shot from boat. (…) We are fishing out in the open sea, maybe one – no, say three, four hours out in the sea… We can't very well go back to land just to shoot at the seal, because that's just – well that's just not possible."

The fact that the seal must be landed according to the rules makes the seal hunting even more difficult according to the fishermen. Very often the seal sinks as soon as it has been hit, and if the waters are deep landing could be very problematic. Several fishermen say that a diver is needed to land the seal – and if the fisherman is not a diver himself this could be expensive and time consuming.

[26] Seal was even hunted with clubs when lying on the cliffs, as referred to in node *7.3.7 Measures/protective seal hunting/former hunting*.

"Yes, you would be able to shoot more seal if you were allowed to hunt from boat, that's quite clear. I've shot the two seals I had licence to shoot; the one sank and the other one was hard to land. But I was able to locate them and land them later thanks to the fact that I am even a diver. Otherwise it would be quite hopeless - if you're that far from the seal. It could take up to five, ten minutes before you arrive at the seal."

The disagreement even taps into the discussion on seal protection areas, especially node *7.4 Measures/seal protection areas/no longer needed*. Here the fishermen claim that the actual, much higher, number of seals makes the seal protection areas unnecessary. Not only is the seal sufficiently reproductive without these protective areas, but since the seal protection areas are off-limits for seal hunting it makes effective hunting difficult.

"It's not easy to hunt seal, the authorities deliberately complicate the preconditions to make sure that our results are effortless; the rocks were seal could be hunted in the past are seal protection areas now."

"Annul them (the seal protection areas, editors' comment)! Annul them! They are no longer needed."

This is the one area in which the fishermen from Kalmar County differ somewhat from the fishermen in the model region. Protective seal hunting is not yet allowed south of the model region and Kalmar County is situated just south of the Östergötland. The fishermen in Kalmar are upset that this difference exists – and they perceive it as being very unjust and as a threat to their income and livelihood. Yet again, the fishermen feel that the imprecise estimations of the seal population is causing the problem: if the true number of grey seal was known, protective hunting would be allowed south of Östergötland as well – thereby enabling the fishermen in Kalmar to carry out protective hunting according to a set quota as well.
The fishermen in Kalmar use the same line of argumentation and draw upon the very same facts, values and interests as the fishermen in the model region do. The main difference seems to be that the fishermen in Kalmar are stressing the importance of protective hunting as a measure even more than the fishermen who have access to this measure. The level of frustration seems higher amongst the fishermen who are not allowed to carry out protective hunting and this even influences their view on other measures: their scepticism towards seal safe gear is higher as is their perception of bureaucrats and scientists. It almost seems as if the frustration is blocking the openness towards other measures and that the situation will be locked as long as the rules prohibits the fishermen to carry out protective hunting in the same manner as is done north of them.
It should be noted that several of the fishermen in Kalmar had been given special permits to shoot seal during the last year. The total number of seals shot in this manner equals the general quota given to many of the northern counties. Hence, the frustration over the fact that Kalmar is excluded in the protective hunting carried out according to quotas set in the management plan is not entirely logical: the fishermen in Kalmar are given almost the same quota of seal dispersed on personal licences that are the fishermen in the regions were hunting is carried out according to a general quota.

In the connection of the themes "development of the grey seal population" and "effective hunting" the fishermen describe in detail the main dilemma in which they have fallen through the management plan. They appreciate for different reasons the possibility to shoot seals, however, the technology and method of hunting tolerated make hunting as a method to protect their gear and catch rather inefficient: the quota is too small, the hunting methods do not allow

for quick and safe killing of seals (not many seals can be killed when the shooting has to be from land and the dead body has to be delivered to the authorities). Protective hunting has developed into an expert controversy between the fishermen and the Environmental Protection Agency about the quick and safe killing of seals. This controversy is extended with the following thematic nexus between effects of hunting in relation to behaviour change of seals.

The disagreement on the effects of protective seal hunting in connection to seal behaviour

In node *7.3.13 Measures/protective seal hunting/effects of seal-hunting* another factual disagreement is unveiled. This node collects the contesting views on the effects of protective seal hunting. Whereas the knowledge on the size of the grey seal population is monitored by the Swedish Museum of Natural History, the effects of the protective seal hunting are evaluated by the Environmental Protection Agency on the basis of reports from Project Seals & Fishery (Board of Fishery) and reports from regional administrations.
The evaluation is carried out each year and presented as part of the yearly plan for protective grey seal hunting.
Still, the results seem unclear, there had not yet been clear indications off what effects the protective hunting has had so far. The Environmental Protection Agency, the National Board of Fishery and the regional administrations think that the protective hunting has not been carried out long enough to demonstrate any obvious effects. Since no clear results have been demonstrated by the national authorities, all stakeholders involved are left to speculate on the effects.
Generally, the fishermen believe that the seals will be scared out of the inner archipelago – and preferably entirely away from humans – as a result of effective protective seal hunting. The effect is often explained by referring to the connection between seal hunting and seal behaviour in the past:

"And I believe that it (protective hunting, ed.) results in scaring away the seal – which they will eventually learn. I mean, it wasn't like this when I was a kid. You never heard about having seal in here, in the inner archipelago. It could depend on the food (that the seal is hunting for, ed.) but still – if a seal had been spotted in here it would be busted. And that had effect. They feared humans in another way. I think so. They knew that if they raised their head above the water close to humans then it would bang, right. So naturally that is of great importance."

The fishermen think that the seal has changed its behaviour since it regained its productive capacity and increased in numbers. It is considered to have lost its fear of humans, and some individuals are even thought to have specialised in feeding from the fishermen's gear. This is another part of the disagreement on the effects of protective seal hunting: the question as to whether or not there are specialists amongst the seals that damage the gear, or whether it can be any seal in a group that will damage the gear. For the fishermen the opinion is clear; the seals creating the damage are specialists (only one of the fishermen did not agree with this).

"…and whenever a large seal drowned in the fishing gear the damages would stop for a period. And that points to the theory of specialisation."

This has consequences for the expected effects of the protective hunting: if there are specialists, then the shooting of such a specialist would stop the damage until a new specialist finds the gear. If there aren't any specialists other seals will continue to damage the gear.

The fishermen are aware of the psychological effects of seal hunting: they feel more in control of the situation when it is allowed for them to hunt seal that is damaging gear or catch. This point of view is expressed in node *7.3.15 Measures/protective seal hunting/psychological effects.*

"Yes, it is very important. I feel that it is of great importance from an emotional perspective. I believe that I should be allowed to defend my property, and I'm very frustrated if I'm not allowed to do that. (…) To put it another way: I could be sent to prison for several months if I shoot it without permission, if worst came to worst! I mean: then there must be something wrong with the system. So the permission to carry out protective hunting is very important. I'm a hunter as well, and that clearly adds another perspective. Then they are seen as a hunting resource as well. You don't think of them in the same negative way anymore. I value them more."

The other psychological effect of the right to carry out protective seal hunting is reflected in the perception of the seal. As expressed in the quote above, the seal can be perceived more as a game resource than just as a pest when it can be hunted.
Though the psychological effects are recognized, they are mainly seen as a secondary effect of the protective seal hunting. The moral right to shoot seal that is damaging catch or gear is considered to be important. The right is compared to other shopkeeper's rights and possibilities to defend their property: if a thief is constantly breaking into the shop something must be done to protect the owner's property. The moral rights of the fishermen to hunt seal are reflected in node 7*.3.14 Measures/protective hunting/justification, right to hunt*.

"I don't do it because I want to hunt for seal, but because I want to protect my fishing gear. It's just like any other storekeeper that wants to safeguard the shop from burglary. I see it as burglary. It interferes with my business."

With regard to protective hunting the completed set of argumentation by the fishermen connects in coherent ways their own observations (of seals), interests (with regard to their fishery) and values (in a moral rights-argument) with the help of arguments that fulfil the role of a theory about seal behaviour. This theory is derived from their observations and local knowledge, connected by basic assumptions (about the size of the seal population), hypotheses derived from assumptions and observations (about the behaviour change of seals), and conclusions (with regard to effective hunting). This theory is defended against opposing theories (created by the official seal monitoring agency).

The cleavage between rural and urban interests in nature conservation and resource use

Several of the fishermen think that there is a cleavage between the interests of rural and urban populations when it comes to understanding the conflict, its effects and the fishermen's right to defend their business. This is reflected in node *6.2 Stakeholders in conflict/rural community/urban community.*

"Question: Who is on the seal side of the conflict?
Answer: Just about everyone that is not affected themselves by the damages. But it is all these green muppets (Swedish slang for nature protection activists, ed.) – I mean, many times I get really pissed: I don't like the wildlife policy in Sweden. Urban people are sitting there saying: we have the room for all these animals and we can afford them. But the ones suffering the economical consequences should be compensated sufficiently for the damage, since the city

has decided that we can afford all these animals. At least we should be allowed to protect ourselves."

"Well, I think there is a difference between rural and urban people. At least that's the case for the Environmental Protection Board. (…) But city folks don't understand these things the way we do. They are not able to familiarize themselves with the situation as we can."

When the fishermen portray the conflict as a conflict between rural and urban perspectives, the nature conservation perspective is represented by the urban community. The urban perspective is seen as unrealistic and distanced from the local knowledge and the realities of production. The stakeholders associated with this urban perspective are the Environmental Protection Agency, the Museum of Natural History and the NGO organisations and activists (referred to in a very diffuse and imprecise manner by the fishermen). The politicians are considered to follow this urban perspective of fear of reactions from the urban elites and voters.

From the fishermen's perspective this is even a reflection of an unfair power division: the local producers and communities are ruled by urban people that do not understand the rural preconditions and difficulties. The conflict between seal and fishery is often compared to other wildlife-related conflicts: the conflicts between wolf and livestock keepers; or the conflict between Sami reindeer herders and the lynx. Not only do the fishermen find similarities between the conflict type: a conflict between resource use and nature preservation; but the fishermen even see similarities between themselves as small-scale rural producers and for instance the inland rural livestock herders.
Hence, the conflict between seal and coastal fishery is placed in a larger discourse of resource management and power distribution between the rural and urban areas.

In the comparison with other conflicts (in order to better understand their own conflict) the fishermen unfold a clear perspective – that their conflict is an example of the general conflict between wildlife protection and (small) rural producers. The conflict between seal and fishery is often compared by them to the conflicts between wolf and livestock keepers or the conflict between Sami reindeer herders and the lynx. Not only do the fishermen find similarities between the conflict types (conflicts between resource use and nature preservation) but also between themselves as small-scale rural producers and, for instance, the inland rural livestock herders. This is the only occasion where the seal conflict is placed clearly in a larger discourse of resource use and its control as related to rural and urban people.

Solutions to the conflict/future perspectives

The fishermen are not very specific when talking about future solutions to the conflict. The fishermen living south of the model region that have not yet been allowed to carry out protective hunting as in the model region, generally have a more negative perspective on the future solution of the conflict. As one fisherman says:

"Interviewer: When talking to you on the phone, you said that it is too late to solve the seal conflict. Explain this further.
Fisherman: That's how I feel. I feel that way because the fishery in the outer archipelago is affected by the decrease in population in the entire archipelago area. When the archipelago was more densely populated everything was managed better. Back then everyone helped scaring off the seal and it was still wild. Today there's nothing like that. (…)

We really need to take immediate action now that the damages are increasing. But we won't get very far because discussions are always delayed by the politicians – and at the same time we are suffering the consequences."
The possible solutions so the conflict mentioned by the fishermen all relate to the measures in the management plan: getting higher quotas for seal hunting; getting compensation for invisible damages; and inventing new seal safe gear.

A perspective for the solution of the conflict in the long run is not unfolded in the arguments of the fishermen and they are not very interested in addressing this "speculative theme" which seems too far away from their immediate problems and interests, or which is based on the argument of resignation ("it is too late for solving the conflict").

External conflict factors
The external conflict factors presented here are subjects and factors that came up during the interviews that are not directly connected to the conflict between seals and fishery; but still part of the context. These factors include environmental changes, economical preconditions for the coastal fishermen and other conflicts. These factors should be seen as the scenery in which the seals-fishery conflict is set.
The external conflict factors are not part of a coherent storyline for the fishermen: here the observations are not interconnected logically as in the storyline in opposition – the external conflict factors consist of observations and experiences that are interpreted in a certain way.

The fishermen agree that it has become increasingly difficult to make a living from coastal fishery during the last 20 years. The number of active coastal fishermen has been heavily reduced during this period, and the average age has increased. Furthermore, the fishermen point to the fact that no younger fishermen are interested in starting a business – the future is to uncertain and the incomes to low to attract a future generation of fishermen.

The reasons mentioned for the economical decline in coastal fisheries are:

Environmental changes. (Node: 4. Environmental changes.)
The node includes eutrophication; industrial pollution; changes in fish species and abundance; as well as cormorant.
The fishermen especially points to the first two factors, eutrophication and industrial pollution, when they want to explain the changes in fish species and stock. The eutrophication is considered to be especially damaging for the reproduction of traditional species found in the inner archipelago: eel, pike and perch. A vague optimism can be detected, since some effects of eutrophication are described as decreasing; for instance the bladder wrack is re-establishing itself in some of the fishing waters. Still alga flowering is common in the model region as in most of the Baltic.

"The perch has disappeared as well, though there used to be plenty of it. And there's only a remnant left of the pike-perches. And that seams strange – the waters used to be really good. I think it's because of the eutrophication. You see it in the reed – when we put out eel traps before; the reed would be broken down into short pieces that would float on the surface. Now it's just a green gruel! That is a sign of eutrophication. The water is even clearer now. Yet another sign to indicate that everything's not as it should be. You see the same phenomena in the Mediterranean; and there's no fish there either. (…) Before I couldn't spot the sea bed from my jetty, but now I can. That's the first time in thirty years – so something must be wrong." Quote from fisherman.

It should be noted that some positive effects of industrial production are mentioned by several fishermen. The turbines of paper mills are considered to have positive effects on the water quality, since the water is enriched with oxygen. Secondly, the former method of rafting timber from northern Sweden to the south is sadly missed: the fish stems were following the rafting (for the insects in the timber and the protection), and the fishermen found it to be successful to fish near the raftings.

The major changes in fish species and stock are seen to be: lack of herring (that was a major part of the income until the mid-eighties); lack of pike and perch (species traditionally found in the model region); lack of eel in some areas of the model region (especially in the northern parts of the region); and lack of cod.
The changes in species and stock are considered to be effects of eutrophication and extensive fishery.

"…you'll have to consider the state of the sea bed. We believe that a certain kind of vegetation is needed – it grows to be about ten centimetres and is brown and quite rough. We think that it has to be nice and clean to enable the herring to reproduce. If the sea bed is full of slimy algae, then we imagine that the roe might suffocate and rot instead. But that's just a theory." Quote from fisherman.

"People didn't fish they way they do now. They didn't fish as intensively right after the reproductive period. Now they use quite intense methods. More fish were left to reproduce before and then there was more fry left as well. It's a vicious circle if the fishery is carried out that way." Quote from fisherman.

The cormorant is considered to be a major problem for the coastal fisheries, in some respects even more so than the seal. Whereas the seal is mainly seen as a problem due to the direct damages on gear and catch; the cormorant is perceived as a threat to the fish stocks in general. It is assumed that the large populations and colonies of cormorants are eating larger amounts of fish than the grey seal. The seal is considered to be a natural part of the marine environment, whereas the cormorant is perceived as an intruder. It should even be noted that the historical use of seal as a resource effects the perception of the value of the seal; the cormorant has not been used as a resource as has the seal.

"Well, I think that the cormorant is just as big a problem as is the seal is, really. The seal mostly eats fish that has been reproducing – the cormorant eats everything, often fish that haven't reproduced yet. That's why the cormorant is much more of a threat to the stock as such as the seal is, that's my conviction. And, until now, the cormorant population is so much larger. Though the seal population might grow rapidly." Quote from fisherman.

The fact that the management plan for grey seal offers compensation for damage on gear and catch, as well as for developing seal safe gear and outlining rules for protective hunting seems to have some positive effects compared to the cormorant. There is no management plan for cormorant, and thereby no compensation offered for the losses perceived by the fishermen. So far, the only possible method to deal with cormorant related problems has been protective hunting managed by the regional administrations.

<u>Economical changes in the coastal fisheries.</u> (Node10. Economical change, coastal fishery).

In the node fishermen point to the changes in prices, distribution and livelihood during the last 20 years. The change in species mentioned above has even had major impacts on the economy of the fishermen. Many were dependant of the large stocks of herring and cod to supplement the more traditional archipelago species such as pike, perch and eel. Now that the stocks of herring and cod are declining, it is increasingly difficult to make ends meet. The fishermen feel that the prices hasn't kept up with the general inflation and several of them think that the diminishing number of wholesalers are pressuring them since there is not competition amongst the wholesalers. Some fishermen even believe that the wholesalers agree amongst themselves to set the prices at a certain level to prevent competition:

"There are only tree-four wholesalers that deal with eel in Sweden. So it's not very hard to come to an understanding with them. We firmly believe that they conspire to decide on the prices. It's hard to tell whether this was conscious or unconscious at first, but that's the situation now anyhow." Quote from fisherman.

Previously the fishermen had their own distribution and marketing centrals (often cooperatively owned), but these structures went bankruptcy during the 80'ties due to competition from larger retailers and large scale fishery.

Infrastructure is a major concern for the fishermen. Since there are no longer as many fishermen along the coast, it has become increasingly difficult to arrange common transportation and finishing of the products. This means that the fishermen now have to bring their products to the nearest retailer, or alternatively arrange a pickup in a nearby location were several fishermen can sell their products. This has serious implications for the fishermen and their economy: not only is it time consuming and expensive to bring the products to the retailers themselves, but it even effects the quality of the products – the fish is transported to remote centrals and sold on from this point. One of the unique qualities of the small scale coastal fishery has been that the fish is very fresh and is only transported a small distance to the consumers. The existing infrastructure threatens this quality aspect.

"We send the rest of the fish (except the eel, ed.) to the fisheries auction in Göteborg. We started doing that four or five years ago and that was positive from an economical perspective, except from this freighting business. Now we have to get the fish to xxx to load it onto a truck there, and we have the costs of freighting it to Göteborg." Quote from fisherman.

The very limited possibilities to make a living from coastal fisheries has effected the recruitment of young fishermen; the middle age is very high and it is not likely that a new generation of fishermen will be interested in perpetuating the fishery. The fishermen express great concern about these negative prospects for the future. Many of the fishermen stem from families with fishing traditions and the lack of future fishermen would mean the end of a way of using local knowledge and cultural specialisation.

The large scale fishery carried out in the Baltic is seen as part of the problem. The fishermen tend to choose their words carefully when talking of the large scale fishery, and especially of the National Fishermen's Association. There is some discrepancy within the group of fishermen interviewed on this issue: fishermen fishing in the inner parts of the archipelago (often on a smaller scale than the ones fishing in the outer parts of the archipelago) are more critical towards the large scale fishery than are the others. The more critical fishermen are often associated with or active in the Coastal fishermen's Association.

Other conflicts affecting coastal fishermen or the coastal areas

There are other conflicts within the fishery sector or in the coastal areas that are affecting the fishermen. This is reflected in node *11.Other conflicts*. Some of the aspects mentioned above in the section dealing with environmental changes can also be seen as conflicts or part of ongoing conflicts (the cormorant is an example of such a theme that can be seen both as part of an environmental change and as a conflict factor in itself. However, we have chosen this division of categories.)

The conflicts can be categorized into two groups:

c. Conflicts relating to access to water. These conflicts are mainly affected by the new residential patterns in the archipelago areas. There has been a shift from permanent residents to part time and summer residents in the archipelago areas. The recreational residents are not inclined to leave room for productive activities such as fishery. The water rights are often associated with land ownership – thus making it harder for the fishermen to gain access to coastal fishery waters. Moreover has the property taxes risen quite dramatically in areas that attract recreational residents; adding to the costs of the permanent residents.
   The fishermen perceive the new taxes and the difficulties gaining access to water as part of a marginalisation of the traditional productive activities. They find it contradictory that the governmental policies speak of keeping 'a living archipelago' at the same time as the living conditions in the archipelago are getting increasingly difficult.

d. Conflicts relating to fishery policy. The coastal fishermen perceive their fishing methods as more traditional and sustainable than large scale fishery. This is mainly due to the fact that the gear used in coastal fishery is small-scale and selective (mainly targeting traditional species found in the archipelago). The common fishery policy is considered to support the large scale fishery, whereas the coastal fishery is marginalised and even fought back. The banning of cod caught in the Baltic is one example of this: the coastal fishermen argue that cod caught using small-scale, traditional methods should indeed be supported, whereas the cod caught by large-scale trawlers should be banned. The discussions related to eel fishery are perceived in the same way. From the coastal fishermen's perspective it is the method of production that should be controlled and restricted – not the geographical area or the species.

The external conflict factors are not part of a coherent storyline of the fishermen: here the observations are not interconnected logically or by arguments as in the storyline in opposition to the management plan where on topic is connected to another in a chain of arguments. The external factors consist of observations and experiences that are interpreted in a certain way. They are presented as an open list of arguments in a trial to set the seal conflict into context (preventing an isolating or reductionist view). It is the complexity of the conflict picture emerging then that makes it practically impossible to unfold this external context in form of a coherent and clear storyline: at more abstract levels of reasoning all context factors can be seen as connected with each other and merge into a hypercomplex diagnosis of the reasons and causes of the seal conflict. This would no longer allow to derive specific measures as done in the management plan; it would, however, require to initiate larger changes, for instance in fishery policy, which cannot be limited in its significance to a solution of a specific conflict.

8 Common Patterns

The main intent of Work Package Six is to inform the processes in the various countries as they move towards the development of policy instruments (WP Nine) and the designing participatory decision strategies (WP Ten). The identification of generic insights or common patterns takes a secondary role. Nevertheless, the basic objective of Work Package Six, getting the information needed to build a politically sensitive and effective reconciliation action plan is going to have to be included in the final Framework for Reconciliation Action Plans. Therefore it is important that some general reflections on the process be included.

8.1 Methods

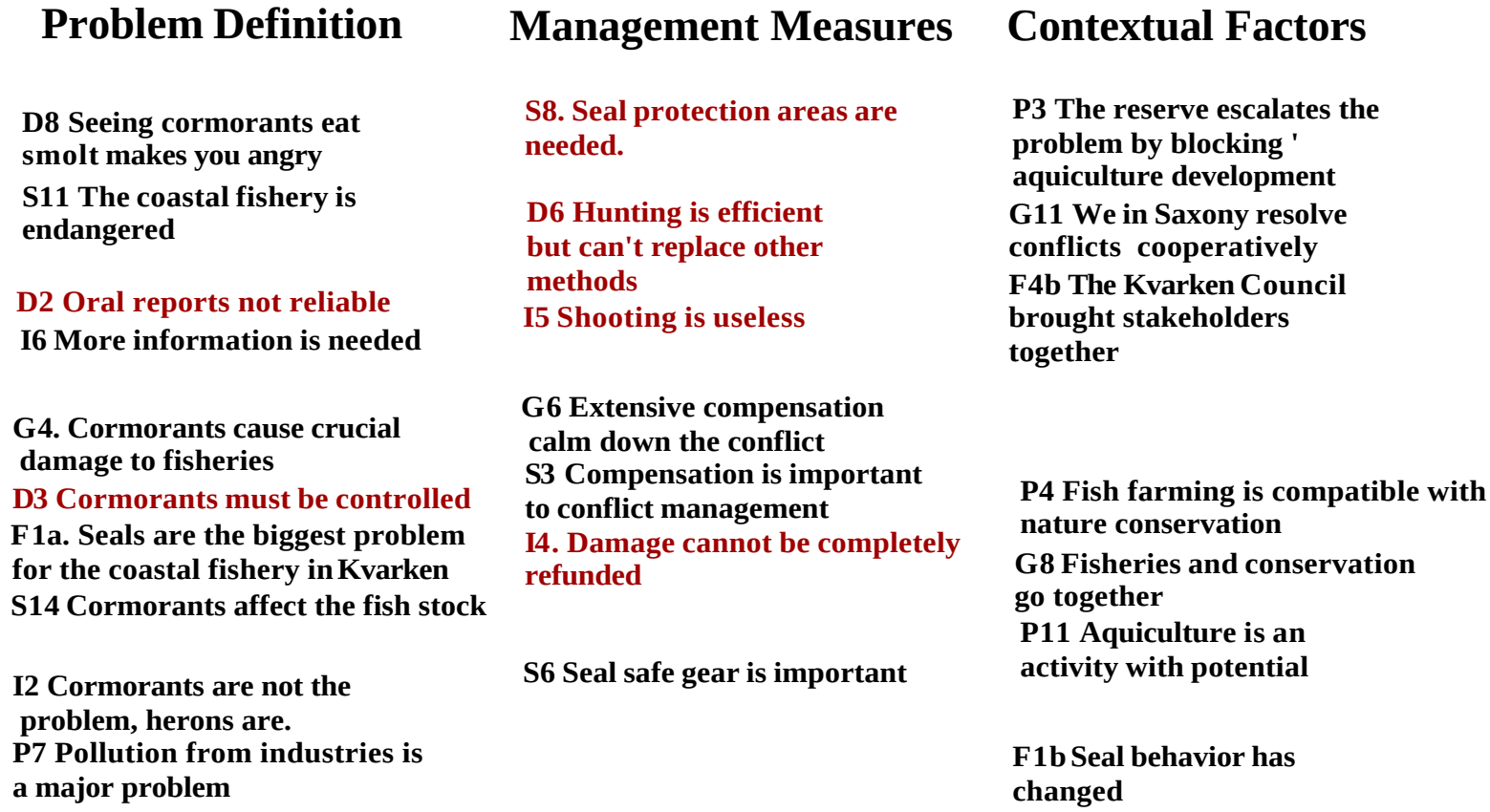
FRAP is a research project while a framework for a Reconciliation Action Plan (RAP), so the approach to understanding how the local political context of the conflict was both more systematic and more experimental than it would be in a framework for a RAP. A detailed theoretical approach was specified and specially designed software was used. While this no doubt produced a more systematic product than would have happened otherwise, it would be difficult to reproduce this in approach in the creation of a RAP.

What is methodologically critical for a RAP is the compilation of the basic themes of the discourse analysis and the presentation of this compilation to the stakeholders. This compilation needs to be done through interviews. This is because public meetings do not allow for the detailed give and take that make possible a sufficiently complete understanding of how stakeholders see the issues. While the question of a statistical sample does not arise, the interviews will have to be enough in number so that the RAP facilitators or, whoever is doing the interviews, no longer hears clearly new ways of linking facts, values and interests. The identification and naming of the themes can be carried out intuitively and this information presented to stakeholders for reaction and confirmation that the themes cover the main issues and understandings in the discourse.

8.2 Patterns Across Model Regions

Figure 8.1 pulls together the themes identified by each country team as being both salient to stakeholders and, in the judgement of the team, important in the management of the conflict. Three types of themes emerged from across the six model regions. Eleven of the important and salient themes relate to different ways that the problem over which there was a conflict was defined. Seven of the important themes relate to specific management measures. Six of them relate to contextual factors, meaning that drivers from outside the direct conflict between fisheries and protected vertebrates are seen as critical to the management of the conflict. The themes related to problem definition fall into four sets. The first set all come from northern countries and relate to feelings of fear and anger that user sets have toward the uncontrolled

Figure 8.1 Themes from the Discourse Analysis



vertebrates. It defines the problem as one of dealing with dangerous pests that threaten the activities and even livelihoods of fisheries user sets. In these contexts the feelings of threat have in and of themselves become a critical aspect of conflict management. The second type of problem definition is related to knowledge base of the conflict and these themes see the problem of one of inadequate kinds or amounts of information. The third set of themes is similar to the first set but rather than defining the vertebrates as a threat sees them rather as a management problem. The fourth set of themes points to other sources of impacts that are more important for the fisheries than the protected vertebrates.

The themes related to management measures also fall into four categories, which indicate the types of management measures most salient to conflict resolution. The first is specific protected areas for the vertebrates, which are mentioned only in Sweden. The second is the shooting of cormorants, which is at issue in both Denmark and Italy. The third is the use of monetary compensation, which plays an important role in the discussion in Germany, Sweden and Italy. The fourth mentions technical solutions which are important in Sweden in the form of fishing gear that mitigates the damage from seals

The important themes related to contextual factors are of three types. Themes related to the existing institutional processes for conflict management are important in Portugal, Germany and Finland. In the case of Finland this is because a local institution, the Kvarken Council, has done a particularly good job of bringing together stakeholders and enabling problem solutions. In the case of Portugal, the lack of mechanisms for communication between the fish farmers and the managers of the protected areas has been an important block to progress. In Germany a cultural aspect of the conflict is a history of cooperative conflict resolution that all stakeholders draw on which makes conflict management easier. The second set of theme relates to the importance of the fishing industry and a belief that ways can be found to allow both conservation and fisheries to coexist. This is important in Germany, where it is closely related to the theme of cooperative conflict resolution. The other two themes are both an important part of the Portuguese conflict where there is a need to build and acknowledge the legitimacy of the aquiculture activities. Finally, in Finland a biological claim, that seal behaviour has changed, is being called upon to justify continual engagement in conflict management.

In Figure 8.1 the important themes that are basically agreed upon by stakeholders are coloured black while the important themes that are contentious are coloured red. There is agreement across the board about contextual factors that are seen as important to the conflict.

There is also a general agreement about problem definition with some interesting exceptions. The first, which came up particularly in the Italian study, is about what constitutes “perceptions” and what constitutes ”science”. All discursive themes are anchored by a series of facts that are then related to interests and values. Within the use of these facts there is an inevitable process of social construction of nature. Setting lies aside, there are two basic sets of mechanisms by which the social construction of nature happens. The first is in the selection of facts that are found to be possible and useful to communicate by different individuals and social groups. In any investigation of nature, from a fishing boat to a laboratory, a certain set of facts is going to be selected as relevant and inscribed for presentation to others. Even if all of these facts were established as true, which is possible in principle but not, for any complex question, in practice, their selection and the use to which they are subsequently put would still be a social construction of nature. In almost every case, an honest presentation of facts will take the form of a narrative which contains facts about which the communicator holds many different levels of certainty, from the author? s own direct experience to something that is generally accepted as true without reflection. The second set of mechanisms of social construction are based on how we perceive facts, rather than on the facts we choose to communicate. Both scientists and the lay public evaluate facts in terms of their source and the

social location of facts is what determines their effective validity. Neither of these mechanisms of social construction requires us to assert that facts about nature are impossible, in principle, to establish as true. However, it does point to the great difficulty that attaches to trying to declare that X is science while Y is a perception. Science is also made up of perceptions, the only real difference is that scientific perceptions are attached to a procedure in which the person is able to account in detail for how the perception is arrived at. Science is a process of extreme transparency and, in general, increase the transparency
The next exception to the general agreement about problem definition might be called "managerial ideology". This is a general category that points to several things, but what they have in common is a commitment to values about how to relate to nature that are difficult to resolve through negotiations. One of them is the desirability of management as such. Throughout the processes of definition and practical experiment with respect to the goals of conservation there has been an ongoing ideological struggle over the degree to which nature should be managed at all. Stanley (1995) articulates the anti-managerial position when he asserts that the underlying assumptions of the management of nature are that 1) science can determine how ecosystems function; 2) once function is known society will be able to protect ecosystems; and 3) that reality will triumph out of necessity. The Danish case in particular has been influenced by people within government environmental agencies who raise question from the perspective that a strong case has to be made before managerial action are implemented at all. They have argued, for instance, that food availability will limit sufficiently limit the expansion of the cormorants. Even more difficult to resolve through negotiated processes are the assertions of empathy with individual animals that make it difficult to agree to hunting or otherwise killing or wounding them. This attitude toward animals is particularly salient in debates within the Italian and Swedish model regions. Beyond these two areas, agreement on principles is basically good. There is broad agreement about the strong impact of institutional processes on discourses. This is encouraging in terms of the value of the RAPs. Stakeholders generally view conservation and economic activities as basically compatible and are willing to work through cooperative decision making system. The problems, of course, are found in the details, as can be clearly seen from the much higher amount of red colour in the central column of Figure 8.1. The focus of disagreement is on specific actions. Even in the area of compensation for damage, which is argued in several model regions to play an important conflict dampening role, there is disagreement about the appropriate levels of compensation. All of this is to be expected. There would be no reason for Reconciliation Action Plans if there were no disagreement about how these things should be carried out. The basic message of these cross-Europe patterns, however, is upbeat in that most stakeholders believe that their goals are compatible and that the development of institutions for conflict management is a real possibility. That is what is critical from the perspective of developing a generic framework. It will always be the task of the individual stakeholders to work out the details of their agreements.

8.3 Important Lessons Learned

In each of the model regions many lessons about the process were identified. This section chooses one lesson from each of the country teams to highlight for the framework for Reconciliation Action Plans. We discuss these lessons through the following edited and expanded excerpts from each country teams report.

8.3.1 Denmark

Lesson: It is unhelpful to ignore important sources of information.

The Danish case found a serious gap between scientific knowledge and local knowledge in which the latter type of information was not only not incorporated, it was used as a rhetorical tool by some government stakeholders to render illegitimate serious policy questions that they would rather not deal with. When arguments and perceptions originating in local knowledge were occurring persistently the decision makers and researchers should have taken them seriously. If the fishers' claims of cormorant predation in pound nets had been taken seriously 15-20 years ago the conflict would probably had evolved differently. Instead, some stakeholders persisted in dismissing fishers claims because they referred to experience-based 'anecdotal' facts rather that to facts generated by a research methodology. Such an argument glides around the fact that fishers do not have the resources to subject their claims to a formal methodology. Hence, an argument that should have been rooted in the legitimate requirement to base policy on information that has been verified as well as possible was rooted instead in the granting of a privledged position to certain stakeholders over other stakeholders. Science is not about ignoring claims, it is about verifying claims. As a consequence of this use of "scientific" knowledge being the basis for management the legitimacy of the same management is undermined when certain stakeholders knowledge is excluded.

8.3.2 Finland

Lesson: Cooperative Stakeholder Approaches do Allow Conflict Management
The Kvarken Council's grey seal project is the key development in the conflict. During its course the conflict between conservation of grey seals and coastal fishery was given a clear frame in the model region. The views about the conflict itself are not very different between the stakeholder groups and they also seem to agree on many of the details. In fact, it can be argued that the conflict there is, is not so much between stakeholder groups, but rather a one caused by side effects of a (successful) grey seal conservation policy. As a result of the process, there is a quite good co-operation between regional level actors. Stakeholders have become closer to each other and communication is better now than it was before the Kvarken Council's project. The assumption of collaborative action frames the way the issue is handled. The enables a cooperative outcome but also leaves some perspectives getting lesser attention, while some other become more dominant. Because of this there is also a need to improve the weight of some of the stakeholder groups that are already involved. Environmentalists and environmental authorities felt that their views were not completely included in the Kvarken Council's grey project. Furthermore, some new stakeholders should be incorporated. These new groups would be tourism business that has a clear interest in the seals and national level authorities: environmental authorities, fisheries authorities and game management authorities. Incorporating the national level actor's would help to seek support for regional level activities as well as to development of mitigation measures. Disagreements to not go away, and there is always room to improve the process, but the collaborative process.

8.3.3 Germany

Lesson: Interviews and their analysis can be more than just research.
Intensive interviews of the kind conducted within WP6, by the persons who try to initiate the development of a RAP, may have a role in the success of development and implementation of the RAP. This is because, if the interview phase is conducted correctly, all stakeholders would get the impression that the promoters of the RAP have been listening to them. The experience of conducting long largely unstructured interviews in WP 6 confirms that it pays off. We gained a much better understanding of the actual state of interaction (or conflict) and the judgement about different mitigation measures by the persons directly affected. We also got information about mitigation measures not mentioned in the literature or in the media.

This assessment of a conflict could also carry thorough an investigation of the formal and informal ways of communication and decision making, and of which stakeholders are already included in a participatory or cooperative process and which are not. Social impact assessment, and discourse analysis criteria could help develop a participatory approach that could help to reconcile a conflict. It could also be used to evaluate the circumstances under which a traditional decision making through politics, authorities, experts, and lobbying would be the better way to go.

8.3.4 Italy

Lesson: Stakeholder have many unhelpful illusions about the factual situation
Wp 6 interviews have also shown that many "perceptions" are truly false. Among other factual errors, stakeholders exaggerated: the number of wintering migrants in the area by an order of magnitude (a claim of 40,000 v a census of 2700); the amount of food the cormorants eat; the impact on the fisheries from cormorants as opposed to other fish-eating birds; and, the amount of money spent for compensation of cormorant damage and/or received by single producers. So it is critical that information based on research results allows that an informed decision-making process. This cannot be solely based on the perceptions or stakeholders. Conflict management needs a common shared set of data is that is built with the stakeholders. This could be carried out by; 1) collect factual information from the stakeholders after the "perceptions " have been provided; 2) have a semi-public discussion to present this information and other factual, verified information; this would include bringing into the discussion the findings of FRAP, This can be done with the educational material provided for by FRAP.

8.3.5 Portugal

Lesson: The importance of contextual issues.
The discourse analysis found that the most conflicting themes are not directly related to the conflict between otters and fish farms. It was clear that the majority of stakeholders are more concerned with other issues than the otter predation and its conflict with aquaculture. The polluting industries are strongly targeted in most of the interviews. There is a conflict of interests where the conservation of the Reserve clashes with the expansion of fish farms. The conflict is characterised by a strong misunderstanding and, thus, escalation of the conflict between the Reserve and the fish farmers. But other stakeholders, apart from these two, don't seem to be in a close contact with the conflict, except in the sense of a general conflict between the values of nature conservation and economic development of the area. To find effective mechanisms for conflict management, however, it will be important to involve most of the interested stakeholders. This is because there are no strong trust relationships among fish farmers, even those of the same association. Gathering together stakeholders for a participatory process may trigger latent conflicts and they can easily derive to agendas that are not directly related to the conflict between otters and fish farms.

8.3.6 Sweden

The Swedish country team chose to interpret the National Grey Seal Management as the official Swedish 'story line,' at term which the Swedish team chose to use to describe the ways in which particular stakeholders made rhetorical use of the discursive themes. This plan is representative of a highly developed conflict management institution, the most developed one in any FRAP model region. The document is seen as part of the discourse - not only as a joint reference for all stakeholders with their differing interests, but as a stakeholder of its own, a "stakeholder on paper" that articulates the interests of an invisible stakeholder which

can in a preliminary way be described as the public at large The plan can be seen as a stakeholder who "argues" with the other stakeholders about the pragmatics of conflict mitigation that Swedish society is able to realise by way of its government in the context of international and national political agreements and legislation. One aspect of the critical importance of the National Grey Seal Management plan in the present conflict situation is that it constitutes only one of two complete storylines that can be found that cover thematically all or the main aspects of the conflict. These two are the official story in the grey seal management plan and the fisher's story line. All other stakeholders have only "partial" or fragmentary stories. Their stories do not fully develop into clusters of themes that cover the main issues of the conflict. As a group, the coastal fishermen are the only stakeholders that have a complete and coherent story built of interrelated assumptions of facts, interests and values. What is particularly striking is that their storyline is created in opposition to the storyline presented in the National Grey Seal Management Plan. In this highly situation of a highly developed conflict management institution, the official plan in the Swedish case creates a framework around the conflict process which not only supplies a set of rules for how people will progress in conflict management, it seems to also shape the whole set of shared meanings that people draw upon in discussing the conflict. The Swedish team points out that this has had the unhelpful side effect of making it difficult to raise the important questions related to the overall coastal landscape and the role of the small scale fishers within that landscape.

8.4 Final Reflections

What coming out of Work Package Six is important as we move toward the Framework for Reconciliation Action Plans? Perhaps the main thing is an increased sensitivity to the large range of differences that can be found at the local level among these conflicts between fisheries and protected vertebrates. The dimension along which the most critical differences emerged was the degree to which the conflict had already been addressed through creating conflict management institutions.

The results of the discourse analyses emphasize how this process of institutionalisation is also a process of the formulation of shared definitions of the conflict that are necessarily exclusive. At the one extreme is the Portuguese case where the FRAP project's own efforts toward a Reconciliation Action Plan are the first attempt to find ways to manage the conflict between otters and the fish farms. In this case the stakeholder interviews uncovered a whole range of ideas about the nature of the conflict and the issues that should be included in attempts at conflict management. How important is damage from otters when we have all these polluting industries? The other extreme is the Swedish case where conflict management has been highly formalized and the management plan serves not only to manage the conflict but strongly influences the themes that stakeholders draw on in debating the issues. Disagreement here centres on details. What kinds of guns should be allowed when shooting at seals? Discourse analyses from all across Europe indicate that disagreement over the details of conflict management will be ongoing in any context. The Swedish and to some extent the Danish cases demonstrate how existing detailed plans carry of danger of the "juridification" of the issue, i.e., turning it into a debate over legalisms, which can cause the exclusion of important perspectives and increased difficulties for possible reforms. A similar phenomenon can be seen in those cases where conflict management takes the almost exclusive form of compensation payments. The amount and type of payments come to define the issue, and, as the German team pointed out, this can be a disincentive to further creative responses. In each situation the need for reform will focus on things that have been left out, and hence may have already come to be defined as external to the conflict issues. This is true whether or not the existing institutions are well designed and helpful or a problem in and of themselves.

Process matters, and ongoing cooperative process, as shown by the Finish case, can work. Such process must continue to be open to new voices even where important institutions are already in place. A Framework for Reconciliation Action Plans must first take into account the history of a conflict and what kinds of institutions, if any, have emerged to manage, and at times define, a conflict. But we also have to recognize that such a Framework must point not toward the achievements of goals and objectives but toward an ongoing process in which new problem definitions, and new cooperative arrangements, have an opportunity to emerge.

8.5 References Cited

Stanley, T.R.1995"Ecosystem Management and the Arrogance of Humanism" *Conservation Biology* 9(2):255-262.